Adventures in Science Fiction Series

The ROBOT and the MAN

Edited by
MARTIN GREENBERG

A. E. VAN VOGT
LESTER DEL RAY
BERNARD WOLFE
JOSEPH KELLEAM
JOHN S. BROWNING
JOHN D. MACDONALD
ROBERT MOORE WILLIAMS

GNOME PRESS

Adventures in Science Fiction Series

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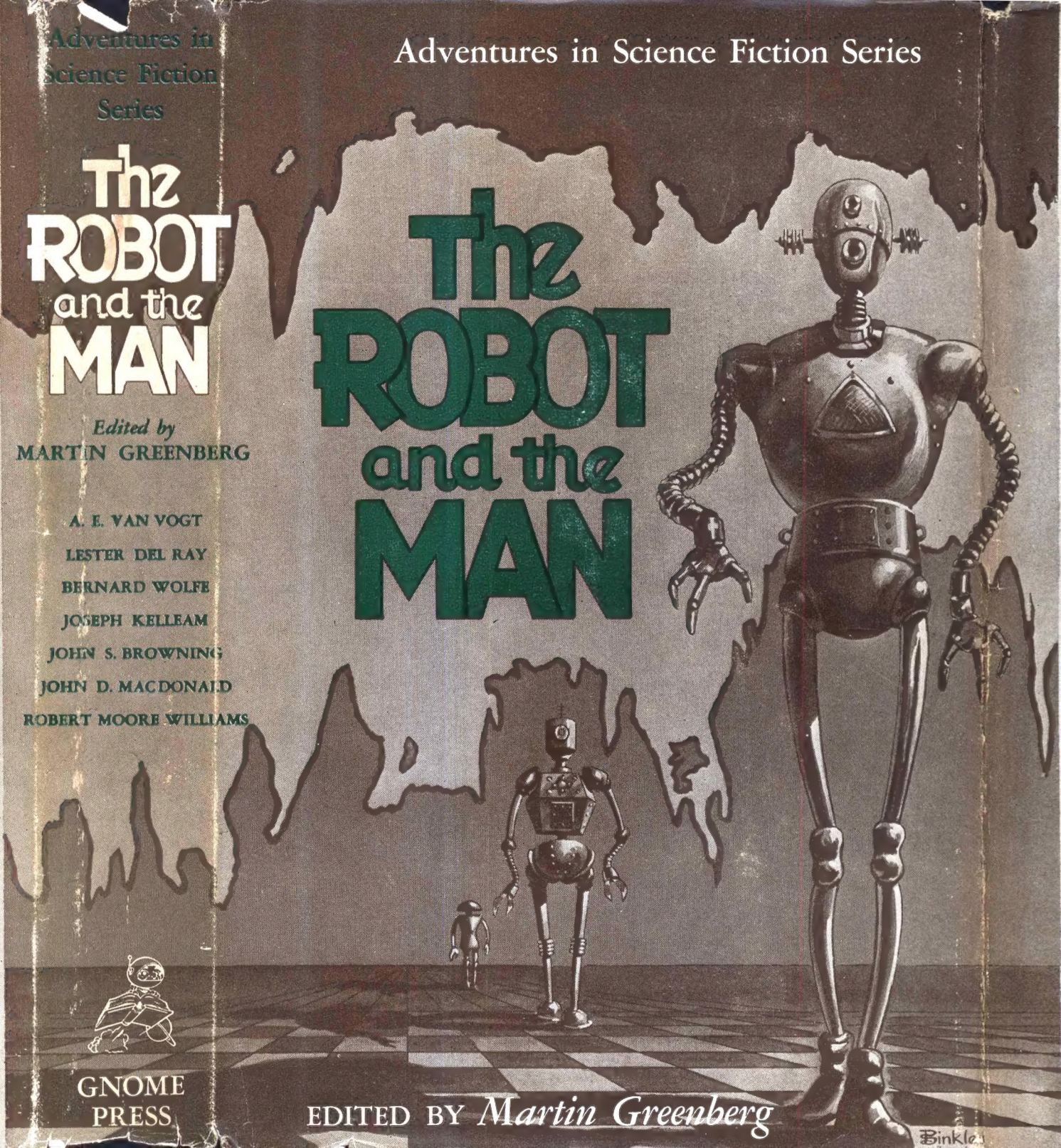

EDITED BY *Martin Greenberg*

$2.95

The Robot and the Man

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As in its predecessors, *Men Against the Stars, Journey to Infinity,* and *Travelers of Space, The Robot and the Man* is an anthology of stories which have been chosen to illustrate a theme and tell a unique story. In the present volume the theme is the invention of the robot and its evolution to the ultimate when mankind has disappeared and only its "servants" remain.

The long evolution of the robot begins with John D. MacDonald's "Mechanical Answer" where the first "thinking machine" has been constructed, thereby laying the groundwork for the development of a functional robot. The essential problem had been to create a brain that could reason for itself. The thread of progress is continued by Bernard Wolfe's "Self Portrait." A vital contribution is made in the perfection of artificial legs and arms. This was of prime importance because of the mobility it gave to the "thinking machine."

The great corporations virtually rule the world when Lewis Padgett picks up the theme in "Deadlock." Private industry may now proceed with the complex details of developing thinking functional robots. Not until world government has unified the earth, as H. H. Holmes' "Robinc" describes it, and the dread of sabotage vanished, can Robots, Inc., the last of the great corporations, develop a functioning robot after the discovery of the Verhaeren Factor. Although the robot was now a mobile unit he was still subject to his creator's command.

(*continued on back flap*)

Jacket Design by Ric Binkley

(continued from front flap)

The inevitable fear that man feels for his ingenious "offspring" is gradually allayed in John S. Browning's "Burning Bright." Although carefully controlled by its creator the robot almost imperceptibly, but steadily, was arriving at acceptance in the society of man. It is only when the robot comes to possess a "soul," in "Final Command" by A. E. van Vogt, that he is at last accepted as an integral part of man's civilization.

Catastrophe strikes earth with the coming of the Plague. Lester del Rey's "Though Dreamers Die" tells of Dr. Craig and Jorgan's escape from the planet. Five Thoradson robots were taken along to assist them in the attempt to save man's dying civilization. Earth is barren when the "Robots Return," in the classic story by Robert Moore Williams, to explore the dust and the rubble. They engage in intellectual speculation about the possibility of a creator called man who fashioned the first robot in the dim forgotten past. Their conclusion is that there was no such fanciful creator.

Joseph E. Kelleam's "Rust" treats of that segment of the theme when the Plague has swept away industry and agriculture. In the bitter struggle for food the survivors discard lofty ideals and introduce robots specifically designed for warfare into the conflict. In the end the robots walk the earth alone. When it appears that the once glorious race of man has died for all time it is reborn in Lester del Rey's "Into Thy Hands," the summit of the long ascent made by the robot up into the sunlight of humanity.

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THE ROBOT AND THE MAN

Edited by
MARTIN GREENBERG

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Bernard Wolfe
John S. Browning
A. E. vanVogt
H. H. Holmes
Lewis Padgett
Joseph E. Kelleam
Lester del Rey
Robert Moore Williams

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FOREWORD

The Robot and the Man is the fourth volume in the Gnome Press Adventures in Science Fiction series. Continuing the outline of its predecessors, *Men Against the Stars, Journey to Infinity,* and *Travelers of Space,* a group of stories has been selected to illustrate and trace the development of a specific science fictional theme. As the title indicates, the theme of *The Robot and the Man* is the genesis and evolution of the robot as depicted by science fiction.

The term "robot" is generally accepted as having first appeared in print with the publication of Karel Capek's play, *R.U.R.,* in 1923. The idea of a mechanical man, however, was not original with Capek; references to it are scattered throughout earlier literature. Probably the most familiar example is Edgar Allan Poe's article, "Maelzel's Chess-Player," which was prompted by an actual so-called robot chessplayer that was dumfounding the world at the time. Although the mechanical Capablanca was eventually exposed as a fraud, this ready acceptance of the hoax indicated that the concept of a robot was not overly incredible for the people of the age.

Contemporary society is served by a host of robots if the definition of the term is strictly adhered to. A robot has been defined as "a mechanism contrived to do human or superhuman tasks."* Such familiar everyday devices as the refrigerator, air conditioning units with thermostatic controls, electric

**Travelers of Space* (Gnome Press, 1951), p. 25.

timing devices, and countless other automatic mechanisms would fit into the definition of the term. Another example, although hardly a commonplace one, of these precursors of the android-type robot is the "waldos," those wonderfully dexterous mechanical limbs used in atomic energy plants to handle highly radioactive and dangerous substances.

In recent times the Voder robot exhibited at the World's Fair of 1939 in New York was more recognizable, in crude outline at least, as the fictional type of mechanical man. This curiosity, of course, could only be thought of as the most rudimentary of robots since it was not capable of independent action, but controlled by an operator.

It was only with the growth of science fiction in the modern period that the notion of a robot was elaborated and more fully developed. This anthology attempts to trace the course of that fascinating evolution.

"Mechanical Answer" and "Self Portrait," the first two stories in this volume, which tell of the problems encountered in developing a mechanical brain and artificial limbs, set the stage for the appearance of the mobile robot. The theme is continued in "Deadlock" and "Robinc" where construction of the actual robot has been attained. In the succeeding stories the "growth" of the robot continues until he ultimately achieves acceptance as an entity by his creators. The final phase in the inevitable ascent of "man's servant" is reached when man has disappeared and only a robotic civilization remains. A new cycle is begun in "Into Thy Hands" when man is re-created by the beings he himself gave birth to.

Attempting to adhere to the outline of the theme was extremely difficult since the stories were written by different authors. It was necessary, therefore, for the editor, and he

takes full responsibility for the measure, to make some minor modifications in the details of the selections.

I wish to thank Groff Conklin for his invaluable suggestions and the consideration he showed in delaying his own anthology, on a similar theme, to avoid any conflict which might take place if such overlapping anthologies were to appear simultaneously.

Martin Greenberg

New York, N.Y.

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THE ROBOT AND THE MAN

The construction of the first "thinking machine" paved the way for the eventual development of a functional robot. The essential problem was to create a brain that could reason for itself.

MECHANICAL ANSWER

by John D. MacDonald

JANE Kayden, the traces of dried tears on her pretty face, said, in a hopeless tone for the hundredth time, "But why does it have to be you, Joe?"

Joseph Kayden, Director of Automatic 81, paced back and forth through the room of their apartment that they called the Main Lounge. After they were married, when permission was given for Jane to live on the premises at Automatic 81, she had designed the apartment. Automatic 81 was in the Mesilla Valley, eighteen miles from Albuquerque.

The two opposite walls of the Main Lounge were of clear glass. One wall looked out across the valley. The other looked out across the vast production floor of Automatic 81, where the humming machine tools fabricated the portable tele sets. Automatic 81 was a nearly average government facility, with all unloading and sorting of incoming raw materials, all intraplant transportation of semifabricated and completed parts, all assembly and all inspection, all packing and labeling accomplished by the prehensile steel fingers of automatic equipment. Joe Kayden, lean and moody, was the director and only employee.

On the end wall was the warning panel. With any break-

down, a buzzer and flashing lights indicated the department and the specific piece of equipment. That portion of operations dependent on the breakdown stopped automatically until the production break was repaired. Kayden was responsible for the complete operation and maintenance. Each month his production quota figures were radioed from Washington and he adjusted his production to fit the quota.

He stopped by her chair and looked down at her, his bleak look softening. "Honey, I can't say no. The government spent eight years and a lot of money filling my thick head with electronics, quantum mechanics and what all. I'm their boy and when they say jump, Joe jumps."

"I know all that, Joe. I know that you can't quit. But why do they have to pick you? They've got what they call their high-level people, the theorists and all. People all wound up in the philosophy of mathematics. You're one of the workers. Why does it have to be you?"

He held his hands out in a helpless gesture. "I don't know. But I can make a guess. They've been appropriated two hundred million a year for the past four years on the project and they aren't getting anywhere. So I guess that some congressman has told them to bring in one of the practical boys from the Department of Civilian Production. They picked me."

"Out of over two hundred men they picked you? Why, Joe? Why?"

"Because I've never missed a quota. Because I've cut the warning board down to less lights than any other outfit. Because I rigged up a new standby system and because I shifted more maintenance over to automatic equipment than anybody else. They just stuck the two hundred and something cards in the sorter and sorted for the guy with the most practical im-

agination and the best ratio of accomplishment. My card dropped out. So they called me up and said, 'Come on down here to Poughkeepsie, Joseph, and take over the Thinking Machine.' "

Out of the midst of her distress, she looked at him proudly and said, "You have done a good job, Joe."

He kicked a small stool closer to her chair, sat on it and took her hand. "Here is the big trouble, Jane. They don't know it and I don't think you do either. But by myself I couldn't have done these things. You're the guy who has . . . what do they say? . . . given me pause to think. You don't know a thing about production or about electronics, honey, but you've got a terrific quotient of horse sense. You've made me see things about this place I'd never have seen by myself. The board is small now because you did so much griping about how much of my time answering the board took. Remember all the times you've started a sentence with, 'Why don't you——?' "

"Yes, but——"

"You've brought the simple outlook of a child to this problem and all I've ever done is take your direct ideas and put them into shape. They don't want me, they want us."

She brightened visibly. "Then why can't——"

"No. They won't do it. They've surrounded the whole project with a batch of phony secrecy. Back in the days when it was called a Project to Develop a Selective Mechanical, Numerical, Semantic and Psychic Integrator and Calculator, we could have both gone on the job. But then, after the press got hold of it and labeled it the Thinking Machine and stated that in the field of warfare it would give better, quicker answers than any General Staff, the War Department made it Top

Secret and that's the way it stands. For you it would be no soap."

The quick tears came again. "Joe, I'll be so lonesome!"

"So will I," he said quietly.

"And I'll be afraid, Joe, darling. Remember when you met Toby Wanderer in El Paso? Remember what he said?"

Kayden nodded. He remembered. Toby had just been fired from the Thinking Machine Project. Not fired, really, but retired with a pension for life. Poor Toby. Toby had got a bit tight and talked more than he should have. He talked about the tremendous strain of the Project, of the strange mental breakdown of the men who worked on it. Something about a machine to duplicate the processes of the human mind. When Toby had cracked the first time, they had given him shock treatments and put him back to work. Finally the interval between the necessary shock treatments grew too small and Toby was given his pension. Toby had cursed the Project with cold fury and said that it was impossible—that the most they'd ever accomplish was a machine which could duplicate the mental processes of a four-year-old child, emotionally unstable, with a limited I.Q. for its years.

Unfortunately Joseph Kayden had told Jane the entire story, never believing for a moment that he would be selected to join the Project, that political expediency would result in his being placed in charge. It was obvious to him that his appointment had been made out of desperation.

"Will you be able to write me?" Jane asked.

"Probably. With censorship. And out of the goodness of their heart they give me two days chaperoned leave every two months."

It was time to leave. The shuttle aircraft was due. Joe packed

moodily while Jane wept some more. The shuttle would bring the new man for Automatic 81. He'd live outside until Jane could find a place to move their possessions to.

At last he was packed and they stood, his arms tight around her, her fair hair brushing his cheek. He whispered, "I'll probably make a blob of it, honey, and they'll boot me out quickly. To keep yourself busy, why don't you brush up on your neurology and psychiatry?"

When he kissed her, her lips tasted of salt. His last look at her was from fifteen hundred feet. She was a forlorn figure, standing out on the patio, waving listlessly.

He was a pale man, almost luminous in his pallor, and he announced himself as Roger Wald, Kayden's Executive Assistant. Wald flapped his pale hands and Kayden thought that he looked as though his face was of moonstone dust, held together with luminous putty.

"How long have you been on the job here, Wald?"

"Oh, over two years. I've been the assistant to some very great men and——"

Kayden grinned. "Yeah. And now you're the assistant to a guy with grease under his fingernails. Buck up, Roger. I brush my teeth and everything."

Wald flapped his gray hands some more. "Oh, I didn't mean to imply that——"

"Skip it, Roger. You just keep telling me the score and we'll get along fine. Is this my room?" Wald had led him into a small plaster cubicle containing one single bed, a chair, a bureau and a glass ash tray.

"Yes, it is. I admit it's a bit bleak, Mr. Kayden——"

"Call me Joe, please."

"Yes sir. The room is bleak. They all are. Dr. Mundreath who was in charge three years ago felt that there should be no distractions, you know."

"No, I don't know. Let me check this. I'm in charge?"

"Oh, yes sir."

"Then your first job, Roger, is to get me a suite of rooms. I want luxury on a Sybarite scale. I want rooms with music, tele sets, wine lists and everything but beautiful hostesses. Got it?"

"Yes, sir."

"Now show me the production setup, the labs and all."

The Project was housed in a series of long, one-story buildings surrounded by a high electrified wall. Interception rocket stations were set up in profusion in the surrounding countryside, the scanners revolving perpetually.

One building housed the best approach to a Thinking Machine that had been devised. The guard let them through the door and Kayden stopped dead. The main room was five hundred feet long and about eighty feet wide. All along the walls stood independent units of the machine. Each unit was plastered with switchboard panels, plug sockets and lamp indicators. Between the interstices of the panels showed an array of electronic tubes, circuit elements, relays.

Kayden looked at a small vehicle rolling smoothly across the floor. A uniformed girl sat in it and guided it. He recognized it as a massive variation of a master programming unit. The girl wheeled it up to one of the independent units against the wall, consulted a chart and plugged in the programming unit. The indicator lamps glowed and the girl took the tape that was ejected from the wall unit. She glanced at it, un-

plugged and wheeled away toward a far part of the room. He could see at least a dozen other master programming units.

"What are they after?" he asked Wald.

"Test problem. With each improvement in the basic equipment, we run the same test problems through."

"What's the problem they're working on now?"

Roger Wald beckoned to one of the girls on the vehicles. She stopped beside them, smiled prettily.

"Mr. Kayden, Miss Finch. Miss Finch, what is the test problem?"

"Chemical exchange separation method, Mr. Wald."

The girl drove away on the silent wheels. Wald said: "We just feed the machine all the factors of a problem—i.e., to devise a simple way of preparing carbon-13 compounds. We know the answer, of course. Other test questions concern other fields—rules of harmonics, heat radiation and so forth."

They walked into the room and, as Kayden looked more closely at the independent units, he began to see the point of approach to the problem. He said, "Give me a short statement of the reasons for failure."

Roger Wald bit his lip. "My training . . . I'd better get Dr. Zander for you. He's in charge of testing and analysis of results. We'll go to his office."

Zander was a man constructed of overlapping pink spheres. His face was covered with a constant dew of perspiration. He had the build, the complexion and the blue eyes to go with what should have been an amiable disposition. But his small mouth was an upside down U of sourness, his eyes were smothered bits of blue glass and his voice was a nasal whine.

He looked at Kayden with what could have been contempt. Kayden sat and Wald stood on the opposite side of Zander's paper-littered desk.

"So! You're the new director," Zander said.

"Right. Glad to know you, Dr. Zander. I've heard about you. Suppose you give me a brief on the present difficulties."

"You want it in layman's language?"

Kayden smiled with his lips alone. "I think I can struggle through the big words with you, Doc."

Zander frowned and put his fat fingertips together, stared at Kayden through the puffy arch. "History first. By 1953 the Electronic Mechanical and Numerical Integrator and Calculator was carried to a point of development where it could solve any problem given to it in the mathematical field, provided the automatic sequencing was fed to it on a paper tape or punch cards. Iconoscopes were set up to act as accumulators to expand the memory factor, and calculations were put on the binary obviating the use of digits two through nine.

"With the first appropriation to develop a Thinking Machine, as it is called by the layman, our problem was to switch from mathematics to semantics. In other words, instead of absolute figures, we had to change over to the fuzzy values of words and phrases. Instead of asking for the cube root to ten thousand places of minus two, we had to ask it what happens when a cat is shot through the head and have it answer that the cat dies. As simple as that.

"To make the changeover, we had to select a language for it. We selected English and took out all variations which add little or nothing to connotation. We gave each sound a numerical value, and combined the numerical values into words. Then, into the expanded memory factor, we fed thousands of

truisms. Naturally, with number-sound valuation, each truism became a formula . . . an equation. Assume that we had fed into the memory factor the phrase, 'Roses are red.' The machine tucks it away as a numerical formula. Then we ask the machine, 'What color are roses?' It translates the question into an open-ended formula, digs into the memory chamber and says back to us, 'Roses are red.'

"Now we can ask a question based on any truism or proven statement that we have fed the machine, and we get the answer. We get it either written or spoken, though I personally consider the vocal attachments to be more toys than anything practical. The voice makes an impression on distinguished visitors, particularly when we permit the visitor to ask his own question. It is embarrassing when the question concerns a statement not previously fed to the memory factor. One congressman asked when his mother would die. The machine gave him a detailed definition of the word mother and a physiological explanation of the meaning of death—what happens when death occurs.

"The next step was to teach the machine basic differentiations. We selected a quality—such as calorie content. Then we stored in the memory factor a complete list of caloric ratings of food. Now, if you ask it the calorie rating of a given food, it will answer, or if you ask it which of two foods has the highest rating, it will select the proper answer. We have fed the machine eighty thousand differentiation lists covering eighty thousand different methods of grading myriad items.

"In addition," he continued, "we have read to it philosophical concepts, records of phenomena, all types of data and information. At the present time we have a superabundance of response. Should you feed it just one word, such as 'steel' or

'indigestion' the machine will give you several volumes of data."

Kayden nodded. "All you've done, in other words, is build yourself an automatic library."

Zander's eyes widened and narrowed quickly. "You are perceptive, Mr. Kayden. In effect, that is what we have. As yet we have no indication of the least creative impulse in the equipment, or how to initiate it. We have had hopes. At one time, in answering an astronomy question the machine faltered and then wrote, 'The moon is ardium.' We were excited and we speculated about new elements, until we discovered that it was merely a partial short in the wiring that had escaped the specialized equipment we have built for the sole purpose of diagnostics and repair."

"And what is the current program?"

"We are feeding the machine more data each day. Each day we expand the memory factor. Our present theory is that eventually, under the pure mass of data given it, the machine itself will break down. Psychoneurosis on a mechanical plane if you will. The place and manner of the breakdown may in itself stimulate us to provide it with some form of intellectual selectivity." He smiled woodenly. "We would all be very happy if the last words of the machine were, 'The hell with it!' "

"But you keep giving it these problems."

"Quite right. The problems are our control. So long as the machine merely repeats back to man what man has fed into it, it will be a failure. So far, that is all that it does. The problems are our continual check to see if by any chance the machine has struck on any creative method."

"If the creative method isn't built into it, how do you expect it to acquire it?"

Zander's smile was broader. "That, my young friend, was the problem which stopped your predecessor. And now it is your problem. If you want to come with me, I'll show you the mechanics of the machine."

Kayden rubbed his forehead with the back of his hand. "No thanks. I'll look at the woods from a distance and climb the individual trees later. I want some time to think about it."

Zander stood up, smirked. "What are your orders, sir?"

Joseph Kayden looked at him in irritation. "Follow existing orders until they're countermanded."

Zander sighed, smiled in a superior fashion and picking up some papers from his desk began to work.

Outside Roger Wald said, "He . . . he's a bit peculiar, Mr. . . . I mean . . . Joe."

"O.K. I'm going to wander around. You get me fixed up with something to live in besides that shoebox with running water." Wald hurried off.

Kayden wandered around. He talked to watchmen, electricians, lab assistants, cooks, janitors. At six he was back in his room with his mind full of figures. Nearly nine hundred people lived and worked within the Project Area. Since its inception, the Project had used up over nine hundred millions. There was little chance of a complete cancellation of the Project, as no politician would be willing to take the chance of saying to the people that all that had gone before was a dead loss.

He sat on his bed and stared out the window at the low, pale buildings. Someone had told him that he had an office, but he was too discouraged to even find it. Probably a secretary or two went with the office. "What are your orders, Mr. Kayden? What are you going to do next, Mr. Kayden?"

Roger Wald came at six, eager and breathless. "Your place is ready, Mr. Kayden. I ordered a complete pre-fab, entirely equipped. The crew has offloaded it at the north end of the area." Wald had one of the little cars used within the Project area waiting and he helped Joseph Kayden with his luggage.

The pre-fab was small, but luxurious. Kayden felt better as soon as he walked in. He said, "All I need now is Jane."

"Jane?" Wald asked politely.

"My wife."

"Oh, of course. Too bad she isn't permitted."

"I'd like to take a run down to New York and get stinking," Kayden said wistfully.

Wald flapped his pale hands. "That isn't allowed either."

Wald had dinner brought to the pre-fab and they ate together. After dinner he sat in front of the synthetic fire, after shooing Wald away, and began smoking jittery cigarettes.

"Jail," he muttered. "Prison! What am I accused of, judge? Joe Kayden, head of the Automatic Mechanical Library of Nonessential Information. I'd like to kick Zander's fat head. What do they expect me to do? Hide inside the machine and give the right answers?"

He walked nervously back and forth through the rooms, kicking petulantly at the furniture, scowling at the rugs. Jane might have a plan. Any plan. The whole thing seems wrong. The wrong slant. The wrong angle. A machine that thinks. What is thinking? Got to get basic about it. Very basic. They're too loaded up with tubes and connections. Need Jane around.

Slowly he felt the pressure of responsibility settling over him. Kayden, the fall guy. The stooge. When would he see Jane? Two months. And then it wouldn't be like being with her. Chaperoned!

He left the pre-fab and started to walk. The area was brilliantly floodlighted. After sixty steps a guard stopped him and sent him home. He told the guard that he was in charge of the place, but the guard rested a hand lightly on the deadly air gun and said that no exceptions were made and that the guard detail answered to the War Department, not to the Head of Project.

Two weeks later and twelve pounds lighter, Joe Kayden sat at his big desk in the executive offices and wrote his fifth letter to Jane. It was the third time he had written the same letter. The first two versions had been returned because of matters touched on which concerned the Project. Jane's letters to him carried so little real news that he suspected that she was having the same trouble, but, of course, would not be permitted to say so in a letter.

She was living in El Paso, where she had found an apartment, and she missed him and she was looking forward to seeing him in New York when he got his first leave.

He puzzled over his letter, trying to find some acceptable way of telling her that he was getting no place on the Project. He watched the shaking of his own hands as he lit another cigarette. He wondered how long he would last—whether it would be better to fake a mental upset as soon as possible. But the thought of the shock treatments scared him. There might be a subsequent personality change which would alienate Jane.

At last he wrote, "I'm very, very happy here, and things are going very, very well. I'm as happy as I told you I'd be when we parted."

The next morning he had her answer. "Darling, I'm so glad

that you're happy," she wrote. And then she ignored the entire matter. She babbled away about how she felt that her letters were probably "engramatical," about how she had played tennis and that the girl she met kept putting "lobes" over her head, about how she was enjoying the "frontal" apartment, about a new three-di movie she had seen about a "Woman of Syn," about how she had been looking over some of her old school "thesis."

He felt a quick wave of pity. Jane was trying so hard to be gay in her letters, but he could see that she was going to pieces. Her spelling was usually perfect. He shoved her letter into the top drawer of the desk, and sat, brooding, cursing the fate that had stuck him into the Project.

After lunch he re-read her letter. Its absurdity struck him again. Surely Jane knew how to spell "sin." Jane had a fine neurological education and had had two years of advanced psychiatric nursing.

As he read the letter he took a pencil and circled the obvious errors in spelling. Wald came in and said, "What are you doing?"

"Oh, the wife wrote me and I think she's going to pieces. Look at the mistakes."

Wald picked the letter up and glanced at the circled words. He frowned. "Joe, does she know any neurology?"

"Why, yes! Why?"

"Look at this. Engram. Know what this is? A lasting trace left in an organism by psychic experience. And look at this! Frontal. And over here is lobe. Add syn to thesis and you have synthesis. Hey, this is a code, Mr. Kayden!"

Joe snatched the letter. "What?"

"I'll have to report this to security, Joe."

Kayden glanced up at him. There was no trace of expression on Roger Wald's gray face. "You will?"

"Certainly. I'm going to write a detailed report. I certainly hope I won't forget to send it over to them. Would you like me to get you a good text on neurology?"

Kayden saw the flicker in the gray eyes. He grinned. "You're O.K., Roger. Yes. Get me a text."

At three in the morning, Kayden finished the book and tossed it aside, turned out his light. But he couldn't sleep. Jane had been the first one to make sense. She had guided him to the heart of the problem. A mechanical approach to thinking. When he did fall asleep, it was to dream of her.

Dr. Zander stood up behind his desk and said firmly: "It is unthinkable, Mr. Kayden! An absurdity!"

"You just work here, Doc. I know what I want."

"You want to run a kindergarten, yes?"

"Possibly. I said to turn off the juice to all your gimmicks. Now listen to what I have to say. What are the two processes in the human mind that we're trying to duplicate? We're trying to build engrams, habitual pathways through the mind. Also, we're trying to create a process of synthesis. Do you agree?"

Zander sat down and said, sullenly: "If you say so, Mr. Kayden."

Kayden suddenly leaned across the desk and fluttered a paper out of the line of Zander's vision. Zander turned his head quickly.

"You see what you did? When you saw motion out of the corner of your eye, your nerves told the muscles of your neck

to turn your head. You didn't think about it. That's an engram, an habitual pattern a mile wide. It would take conscious and hard thought to keep you from turning your head. Does an infant? No. The engram is developed. Listen to me—and stop acting so sullen and superior.

"Take synthesis. In cases of anxiety neurosis, the patient can make no decisions. He thinks of all possible eventualities and they frighten him. Some psychopaths think of no related fact except the one they have in their mind at the moment. In the first place, there is too much synthesis. In the second place there is too little.

"Combine those two factors. Suppose you had a machine into which you built, through varying strengths of electrical current across a field, varying factors of resistance, the faculty of being able to find a path of least resistance depending on the circuit where the electrical impulse started. If your chemists could devise some sort of molecular memory factor, you would have a continually decreasing resistance across this hypothetical field for certain standard questions. In other words, engrams! Don't you see? Habitual thought patterns! Any new item would have to find its own way across, but the old ones would have an established channel."

Zander looked faintly interested. He said: "I think I see what you mean, but——"

"Now add the quality of synthesis. I can think of one way to do it. Use a shifting ratio. Each fact stored in the machine's memory is given a ratio number. Through a sliding value scale, you can alter the ratio numbers in the same way that they affect the problem at hand. For example, the machine may know something about rabbits. If the question you ask the machine, the task you set for it, concerns the orbit of Uranus, then

rabbits would get a ratio number of zero. If you're talking about waltzing mice, rabbits might have a distant bearing and get a very small ratio number. If you're talking about lettuce, rabbits might have a high ratio number. You people should be able to figure out some method of making the ratio numbers plus and minus. Then, in effect, the machine could add up the pro side, the con side, and arrive at a decision. The decision arrived at would set up the beginning of an habitual pattern across this field I was talking about, thus eliminating some of the processes when a related question is asked. Tell me this, Zander: Do you know what I'm talking about?"

Zander examined his pink, dimpled knuckles. "In a way, I do. It is . . . is very new, yes? Hard to adjust oneself."

"Natürlich, my friend. But if your technicians can work it out, it would be beautiful. Just imagine. With any question asked of it, the machine would be able to call on all the vast stored knowledge of the ages, go through the weighing motions, and come up with an unemotional answer. That would be creative thought, because the new is always born from the old. We even had the wrong slant on creativeness. There isn't any such thing. It's all a question of engrams and synthesis."

Zander said, "So for this . . . for this dream of yours, you want everything we are doing scrapped? You want us to start from scratch with nothing but our developments in memory storage facility?"

"I want you to do just that."

"You have my verbal resignation. I'll confirm it."

Kayden leaned back in his chair and smiled at the ceiling. He said softly, "Citizens of North America. Today Dr. Artur Zander resigned from the Thinking Machine Project. Joseph Kayden, in charge of the Project, has announced that, with

success in sight, Dr. Zander resigned because of petty jealousy, because he didn't wish to take orders from a man with fewer degrees than he has. Dr. Zander attempted to refute this statement, but in view of the record of failure of the Project during the time that Dr. Zander——"

"Wait, Mr. Kayden. I have been thinking, and possibly there is more in what you suggest than I at first realized and I would——"

Kayden grinned at him. "Doc, I don't want to force you. I want you to work for me because you want to work for me. How about it? I'll let you resign and I won't say one little word. Of course, it'll be tough for me trying to bumble along with men who don't have your background."

For the first time, Zander gave him an almost human smile. "I stay."

Eleven weeks later Wald stood in Kayden's office saying, "Joe, why don't you go down on the floor. They should be running the first test. They were hooking up when I went by."

"Why should I?" Kayden snarled. "If it works, a grateful government raises my pay and keeps me on the stinking job of managing the monster. If it doesn't work, I'm stuck here until it does. Heads you win; tails I lose. Why don't you go down?"

Kayden sat alone as dusk gradually misted the office, hazing the sharp edges of the furniture, obscuring the picture of Jane on his desk.

The door opened and Dr. Zander walked in. He didn't say a word. He stood in front of the desk. Kayden switched on the light and saw to his surprise that tears were running down Zander's cheeks.

"So it didn't work," he said dully.

In a monotone, Zander said: "The first question asked was: 'What hath God wrought?' The answer was vocal. After a few seconds it said: 'There is no adequate definition of God except that He must exist in the spirits of men, in their hearts and minds. Man, this day, has completed a machine, a device, which, in its mechanical wisdom, well help Man to clarify and explain his environment. But the machine will never supplant the mind of Man. The machine exists because of Man. It is an extension of the inquisitive spirit of Man. Thus, in one sense, it can be said that God, as the spirit of Man, has builded for His use a device to probe the infinite.' "

Kayden couldn't speak. He licked his dry lips.

"Some of them screamed and ran from the room. Some of them thought that it was a trick of some sort. To the rest of us the Machine is already a personality. And yet nothing that it said was emotional. It was factual. The question was asked. It dipped into its store of knowledge and came up with the simplest and most direct answer. The thing knew that it had been built. It knew that it existed. Its existence is a fact. Its own recognition of that fact is something that I hadn't anticipated."

Kayden suddenly saw how shaken Zander was. He came around the desk and took the older man's arm, said gently: "Sit down, Artur. Let me get you a drink."

Zander drained the glass in three quick gulps, set it on the corner of the desk and grinned up at Kayden. All of the man's pretense was gone. He was humble. "You did it," he said simply.

It brought back the sense of loss. "I didn't do it," Joseph said bitterly, "my wife did it. My wife that isn't considered acceptable to come into this place."

"You miss her, don't you?" Zander said, his voice soft.

Kayden jumped up. "Now we've got to demonstrate this thing. I'll get hold of our bevy of angels and we'll give it a coming-out party. Make it for tomorrow afternoon, or the day after. You fix up a list of questions, Dr. Zander, and I'll have Roger fix up the surroundings. Can we move the mike and the amplifier around? Good! We'll wire it for the main assembly hall. Building K. And by the way, get the voice of the monster as deep as you can and slow it down a little. I want it to sound like one of the major prophets."

At five o'clock the assembly hall was filled. The President of the United States of North America was present, as were two score of congressmen, a hundred scientists, dozens of minor officials. After Security had cleared the questions to be asked, the President was given permission to invite Ming, Dictator of the Federated States of Asia, as well as Follette, Ruler of Europe, and Captain Anderson, King of the States of Africa. South America was not represented.

Kayden sat with Roger Wald in the front row. At the appointed time, Dr. Zander walked out from the wings, turned and faced the men who sat in the audience—the men who ruled the world. A switch was turned on and a very faint hum permeated the air. All eyes were turned toward the immense amplifier that filled half the stage.

Zander faced the amplifier and said, into a small microphone: "What hath God wrought?"

In a slow voice of thunder the amplifier gave the answer that Kayden had heard in his office. He turned in his seat and looked at the faces of the men, saw there both fear and uncertainty—and a strange pride, as though each of them had had a hand in the making of the voice that spoke slowly to them.

"When will Man reach the stars?" Zander asked.

After a short silence, the Voice said: "It is possible now. All the necessary problems have been or can be solved with present methods. When sufficient money is given to research and development, space travel will become immediately possible."

The next few questions concerned problems that the physicists had not yet solved. The machine answered two clearly and, on the third, said: "The synthesis of all available data does not provide sufficient basis for an answer as yet. But there is validity in the assumption that the solution will be found by experimentation with the fluorine atom."

Kayden glanced at the list in his hand and saw that Zander had asked the last question. To his surprise he heard Zander say, "The development of the Thinking Machine has been a process surrounded with secrecy because of its possible use in warfare. Will the machine help in the event of a war between nations?"

During the long pause before the question was answered, a man jumped up and yelled, "Turn it off!" He was ignored. The representatives of the nations sat, tense and expectant.

The deep voice said: "The Thinking Machine will help in warfare only in so far as it is possible to utilize some of the scientific advances made possible by the Thinking Machine. However, this is not a valid assumption. Warfare should now become avoidable. All of the factors in any dispute can be given to the Machine and an unemotional fair answer can be rendered. The Machine should not be a secret. It should be duplicated a score of times and made available to all nations. Thus can disputes be avoided. The effort to enforce secrecy is barren effort. Secrecy in the case of the Machine accomplishes nothing."

Zander turned and walked from the stage. The humming stopped suddenly. The assembly hall was silent. The rulers of nations looked at each other and in their eyes was a new promise of trust, of acceptance.

Roger Wald was whistling as he came into Kayden's office. "The bans are lifted today," he said happily. "Come and go as you please. O fine and happy day! When does Jane arrive?"

"At four."

"Good. You'll get cocktails at your place at four-thirty. I'll have them sent over."

Wald turned to go. "Wait a minute, Roger," Kayden said. "I know I owe Zander for the fact that the security measures are done with, but what on earth ever got into him to ask that question?"

"Didn't he ever tell you? He must be shy. He and I were working late on the setup, and just for the hell of it, he asked that question. You see, he and I had been talking about you and your busted home life. We liked the answer so well that he decided to use the question in front of all the folks."

Wald left the office. Joseph Kayden glanced at his watch. Two-fifteen. Just one hundred and five more minutes. He walked into the silent, empty assembly hall and turned on the amplifier. He grinned and said into the mike: "Does she still love me?"

There were a few seconds of silence. Then the Machine boomed, with what was almost irritability: "Does who still love whom? The question must be specific."

The next stage in the development of the robot was construction of the body. Park's contribution—artificial legs, and then arms—was of prime importance in giving mobility to the "thinking machine."

SELF PORTRAIT

by Bernard Wolfe

October 5, 1959

WELL, here I am at Princeton. IFACS is quite a place, *quite* a place, but the atmosphere's darned informal. My colleagues seem to be mostly youngish fellows dressed in sloppy dungarees, sweatshirts (the kind Einstein made so famous) and moccasins, and when they're not puttering in the labs they're likely to be lolling on the grass, lounging in front of the fire in commons, or slouching around in conference rooms chalking up equations on a blackboard. No way of telling, of course, but a lot of these collegiate-looking chaps must be in the MS end, whatever that is. You'd think fellows in something secret like that would dress and behave with a little more dignity.

Guess I was a little previous in packing my soup-and-fish. Soon as I was shown to my room in the bachelor dorms, I dug it out and hung it way back in the closet, out of sight. When in Rome, etc. Later that day I discovered they carry dungarees in the Co-op; luckily, they had the pre-faded kind.

October 6, 1959

Met the boss this morning—hardly out of his thirties, crew-cut, wearing a flannel hunting shirt and dirty saddleshoes. I was glad I'd thought to change into my dungarees before the interview.

"Parks," he said, "you can count yourself a very fortunate young man. You've come to the most important address in America, not excluding the Pentagon. In the world, probably. To get you oriented, suppose I sketch in some of the background of the place."

That would be most helpful, I said. I wondered, though, if he was as naive as he sounded. Did he think I'd been working in cybernetics labs for going on six years without hearing enough rumors about IFACS to make me dizzy? Especially about the MS end of IFACS?

"Maybe you know," he went on, "that in the days of Oppenheimer and Einstein, this place was called the Institute for Advanced Studies. It was run pretty loosely then—in addition to the mathematicians and physicists, they had all sorts of queer ducks hanging around—poets, Egyptologists, numismatists, medievalists, herbalists, God alone knows what all. By 1955, however, so many cybernetics labs had sprung up around the country that we needed some central coordinating agency, so Washington arranged for us to take over here. Naturally, as soon as we arrived, we eased out the poets and Egyptologists, brought in our own people, and changed the name to the Institute for Advanced *Cybernetics* Studies. We've got some pretty keen projects going now, *pret*-ty keen."

I said I'd bet, and did he have any idea which project I would fit into?

"Sure thing," he said. "You're going to take charge of a very important lab. The Pro lab." I guess he saw my puzzled look. "Pro—that's short for prosthetics, artificial limbs. You know, it's really a scandal. With our present level of technology, we should have artificial limbs which in many ways are even better than the originals, but actually we're still making do with modifications of the same primitive, clumsy pegs and hooks they were using a thousand years ago. I'm counting on you to get things hopping in that department. It's a real challenge."

I said it sure was a challenge, and of course I'd do my level best to meet it. Still, I couldn't help feeling a bit disappointed. Around cybernetics circles, I hinted, you heard a lot of talk about the hush-hush MS work that was going on at IFACS and it sounded so exciting that, well, a fellow sort of hoped he might get into *that* end of things.

"Look here, Parks," the boss said. He seemed a little peeved. "Cybernetics is teamwork, and the first rule of any team is that not everybody can be quarterback. Each man has a specific job on our team, one thing he's best suited for, and what *you're* best suited for, obviously, is the Pro lab. We've followed your work closely these last few years, and we were quite impressed by the way you handled those photoelectric-cell insects. You pulled off a brilliant engineering stunt, you know, when you induced nervous breakdown in your robot moths and bedbugs, and proved that the oscillations they developed corresponded to those which the human animal develops in intention tremor and Parkinson's disease. A keen bit of cybernetic thinking, that. *Very* keen."

It was just luck, I told him modestly.

"Nonsense," the boss insisted. "You're first and foremost a talented neuro man, and that's exactly what we need in the Pro

department. There, you see, the problem is primarily one of duplicating a nervous mechanism in the metal, of bridging the gap between the neuronic and electronic. So buckle down, and if you hear any more gossip about MS, forget it fast—it's not a proper subject of conversation for you. The loyalty oath you signed is very specific about the trouble you can get into with loose talk. Remember that."

I said I certainly would, and thanks a whole lot for the advice.

Damn! Everybody knows MS is the thing to get into. It gives you real standing in the field if it gets around that you're an MS man. I had my heart set on getting into MS.

October 16, 1959

It never rains, etc.: now it turns out that Len Ellsom's here, and *he's* in MS! Found out about it in a funny way. Two mornings a week, it seems, the staff members get into their skiing and hunting clothes and tramp into the woods to cut logs for their fireplaces. Well, this morning I went with them, and as we were walking along the trail Goldweiser, my assistant, told me the idea behind these expeditions.

"You can't get away from it," he said. "$E=MC^2$ is in a tree trunk as well as in a uranium atom or a solar system. When you're hacking away at a particular tree, though, you don't think much about such intangibles—like any good, untheoretical lumberjack, you're a lot more concerned with superficialities, such as which way the grain runs, how to avoid the knots, and so on. It's very restful. So long as a cybernetic ist is sawing and chopping, he's not a sliver of uncontaminated cerebrum contemplating the eternal slippery verities of gravity and electromagnetism; he's just one more guy trying to slice up one

more log. Makes him feel he belongs to the human race again. Einstein, you know, used to get the same results with a violin."

Now, I've heard talk like that before, and I don't like it. I don't like it at all. It so happens that I feel very strongly on the subject. I think a scientist should like what he's doing and not want to take refuge in Nature from the Laws of Nature (which is downright illogical, anyhow). I, for one, enjoy cutting logs precisely *because,* when my saw rasps across a knot, I know that the innermost secret of that knot, as of all matter in the Universe, is $E=MC^2$. It's my job to know it, and it's very satisfying to *know* that I know it and that the general run of people don't. I was about to put this thought into words, but before I could open my mouth, somebody behind us spoke up.

"Bravo, Goldie," he said. "Let us by all means pretend that we belong to the human race. Make way for the new cybernet-icists with their old saws. Cybemeticist, spare that tree!"

I turned around to see who could be making jokes in such bad taste and—as I might have guessed—it was Len Ellsom. He was just as surprised as I was.

"Well," he said, "if it isn't Ollie Parks! I thought you were out in Cal Tech, building schizophrenic bedbugs."

After M.I.T. I *had* spent some time out in California doing neuro-cyber research, I explained—but what was *he* doing here? I'd lost track of him after he'd left Boston; the last I'd heard, he'd been working on the giant robot brain Remington-Rand was developing for the Air Force. I remembered seeing his picture in the paper two or three times while he was working on the brain.

"I was with Remington a couple of years," he told me. "If I do say so myself, we built the Air Force a real humdinger of a brain—in addition to solving the most complex problems in ballistics, it could whistle *Dixie* and, in moments of stress, pro-

duce a sound not unlike a Bronx cheer. Naturally, for my prowess in the electronic simulation of I.Q., I was tapped for the brain department of these hallowed precincts."

"Oh?" I said. "Does that mean you're in MS?" It wasn't an easy idea to accept, but I think I was pretty successful in keeping my tone casual.

"Ollie, my boy," he said in an exaggerated stage whisper, putting his finger to his lips, "in the beginning was the word and the word was mum. Leave us avoid the subject of brains in this *keen* place. We all have a job to do on the team." I suppose that was meant to be a humorous imitation of the boss; Len always did fancy himself quite a clown.

We were separated during the sawing, but he caught up with me on the way back and said, "Let's get together soon and have a talk, Ollie. It's been a long time."

He wants to talk about Marilyn, I suppose. Naturally. He has a guilty conscience. I'll have to make it quite clear to him that the whole episode is a matter of complete indifference to me. Marilyn is a closed book in my life; he must understand that. But can you beat that? He's right in the middle of MS! That lad certainly gets around. It's the usual Ellsom charm, I suppose.

The usual Ellsom technique for irritating people, too. He's still trying to get my goat; he knows how much I've always hated to be called Ollie. Must watch Goldweiser. Thought he laughed pretty heartily at Len's wisecracks.

October 18, 1959

Things are shaping up in the Pro lab. Here's how I get the picture.

A year ago, the boss laid down a policy for the lab: begin with legs because, while the neuromotor systems in legs and arms are a lot alike, those in legs are much simpler. If we build satisfactory legs, the boss figures we can then tackle arms; the main difficulties will have been licked.

Well, last summer, in line with this approach, the Army picked out a double amputee from the outpatient department of Walter Reed Hospital—fellow by the name of Kujack, who lost both his legs in a land mine explosion outside Pyongyang—and shipped him up here to be a subject in our experiments.

When Kujack arrived, the neuro boys made a major decision. It didn't make sense, they agreed, to keep building experimental legs directly into the muscles and nerves of Kujack's stumps; the surgical procedure in these cine-plastic jobs is complicated as all getout, involves a lot of pain for the subject and, what's more to the point, means long delays each time while the tissues heal.

Instead, they hit on the idea of integrating permanent metal and plastic sockets into the stumps, so constructed that each new experimental limb can be snapped into place whenever it's ready for a trial.

By the time I took over, two weeks ago, Goldweiser had the sockets worked out and fitted to Kujack's stumps, and the muscular and neural tissues had knitted satisfactorily. There was only one hitch: twenty-three limbs had been designed, and all twenty-three had been dismal flops. That's when the boss called me in.

There's no mystery about the failures. Not to me, anyhow. Cybernetics is simply the science of building machines that will duplicate and improve on the organs and functions of the animal, based on what we know about the systems of communica-

tion and control in the animal. All right. But in any particular cybernetics project, everything depends on just how *many* of the functions you want to duplicate, just how *much* of the total organ you want to replace.

That's why the robot-brain boys can get such quick and spectacular results, have their pictures in the papers all the time, and become the real glamor boys of the profession. They're not asked to duplicate the human brain in its *entirety* —all they have to do is isolate and imitate one particular function of the brain, whether it's a simple operation in mathematics or a certain type of elementary logic.

The robot brain called the Eniac, for example, is exactly what its name implies—an Electronic Numerical Integrator and Computer, and it just has to be able to integrate and compute figures faster and more accurately than the human brain can. It doesn't have to have daydreams and nightmares, make wisecracks, suffer from anxiety, and all that. What's more, it doesn't even have to *look* like a brain or fit into the tiny space occupied by a real brain. It can be housed in a six-story building and look like an overgrown typewriter or an automobile dashboard or even a pogo stick. All it has to do is tell you that two times two equals four, and tell you fast.

When you're told to build an artificial leg that'll take the place of a real one, the headaches begin. Your machine must not only *look* like its living model, it must *also* balance and support, walk, run, hop, skip, jump, etc., etc. *Also,* it must fit into the same space. *Also,* it must feel everything a real leg feels —touch, heat, cold, pain, moisture, kinesthetic sensations—as *well* as execute all the brain-directed movements that a real leg can.

So you're not duplicating this or that function; you're recon-

structing the organ in its totality, or trying to. Your pro must have a full set of sensory-motor communication systems, plus machines to carry out orders, which is impossible enough to begin with.

But our job calls for even more. The pro mustn't only *equal* the real thing, it must be *superior!* That means creating a synthetic neuro-muscular system that actually *improves* on the nerves and muscles Nature created in the original!

When our twenty-fourth experimental model turned out to be a dud last week—it just hung from Kujack's stump, quivering like one of my robot bedbugs, as though it had a bad case of intention tremor—Goldweiser said something that made an impression on me.

"They don't want much from us," he said sarcastically. "They just want us to be God."

I didn't care for his cynical attitude at all, but he had a point. Len Ellsom just has to build a fancy adding machine to get his picture in the papers. *I* have to be God!

October 22, 1959

Don't know what to make of Kujack. His attitude is peculiar. Of course, he's very co-operative, lies back on the fitting table and doesn't even wince when we snap on the pros, and he does his best to carry out instructions. Still, there's something funny about the way he looks at me. There's a kind of malicious expression in his eyes. At times, come to think of it, he reminds me of Len.

Take this afternoon, for instance. I've just worked out an entirely different kind of leg based on a whole new arrangement of solenoids to duplicate the muscle systems, and I de-

cided to give it a try. When I was slipping the model into place, I looked up and caught Kujack's eye for a moment. He seemed to be laughing at something, although his face was expressionless.

"All right," I said. "Let's make a test. I understand you used to be quite a football player. Well, just think of how you used to kick a football and try to do it now."

He really seemed to be trying; the effort made him sweat. All that happened, though, was that the big toe wriggled a little and the knee buckled. Dud Number Twenty-five. I was sore, of course, especially when I noticed that Kujack was more amused than ever.

"You seem to think something's pretty funny," I said.

"Don't get me wrong, Doc," he said, much too innocently. "It's just that I've been thinking. Maybe you'd have more luck if you thought of me as a bedbug."

"Where did you get that idea?"

"From Doc Ellsom. I was having some beers with him the other night. He's got a very high opinion of you, says you build the best bedbugs in the business."

I find it hard to believe that Len Ellsom would say anything really nice about me. Must be his guilt about Marilyn that makes him talk that way. I don't like his hanging around Kujack.

October 25, 1959

The boss came along on our woodcutting expedition this morning and volunteered to work the other end of my two-handled saw. He asked how things were coming in the Pro lab.

"As I see it," I said, "there are two sides to the problem, the

kinesthetic and the neural. We're making definite progress on the K side—I've worked out a new solenoid system, with some miniature motors tied in, and I think it'll give us a leg that *moves* damned well. I don't know about the N side, though. It's pretty tough figuring out how to hook the thing up electrically with the central nervous system so that the brain can control it. Some sort of compromise system of operation, along mechanical rather than neural lines, would be a lot simpler."

"You mean," the boss said with a smile, "that it's stumping you."

I was relieved to see him taking it so well because I know how auxious he is to get results from the Pro lab. Since Pro is one of the few things going on at IFACS that can be talked about, he's impatient for us to come up with something he can release to the press. As the public relations officer explained it to me at dinner the other night, people get worried when they know there's something like IFACS going, but don't get any real information about it, so the boss, naturally, wants to relieve the public's curiosity with a good, reassuring story about our work.

I knew I was taking an awful chance spilling the whole K-N thing to him the way I did, but I had to lay the groundwork for a little plan I've just begun to work on.

"By the way, sir," I said, "I ran into Len Ellsom the other day. I didn't know he was here."

"Do you know him?" the boss said. "Good man. One of the best brains-and-games men you'll find anywhere."

I explained that Len had gotten his degree at M.I.T. the year before I did. From what I'd heard, I added, he'd done some important work on the Remington-Rand ballistics computer.

"He did indeed," the boss said, "but that's not the half of it. After that he made some major contributions to the robot chess player. As a matter of fact, that's why he's here."

I said I hadn't heard about the chess player.

"As soon as it began to play a really good game of chess, Washington put the whole thing under wraps for security reasons. Which is why you won't hear any more about it from me."

I'm no Eniac, but I can occasionally put two and two together myself. If the boss's remarks mean anything, they mean that an electronic brain capable of playing games has been developed, and that it's led to something important militarily. Of course! I could kick myself for not having guessed it before.

Brains-and-games—that's what MS is all about, obviously. It had to happen: out of the mathematical analysis of chess came a robot chess player, and out of the chess player came some kind of mechanical brain that's useful in military strategy. *That's* what Len Ellsom's in the middle of.

"Really brilliant mind," the boss said after we'd sawed for a while. "Keen. But he's a little erratic—quirky, queer sense of humor. Isn't that your impression?"

"Definitely," I said. "I'd be the last one in the world to say a word against Len, but he was always a little peculiar. Very gay one moment and very sour the next, and inclined to poke fun at things other people take seriously. He used to write poetry."

"I'm very glad to know that," the boss said. "Confirms my own feeling about him."

So the boss has some doubts about Len.

October 27, 1959

Unpleasant evening with Len. It all started after dinner when he showed up in my room, wagged his finger at me and

said, "Ollie, you've been avoiding me. That hurts. Thought we were pals, thick and thin and till debt and death do us part."

I saw immediately that he was drunk—he always gets his words mixed up when he's drunk—and I tried to placate him by explaining that it wasn't anything like that; I'd been busy.

"If we're pals," he said, "come on and have a beer with me."

There was no shaking him off, so I followed him down to his car and we drove to this sleazy little bar in the Negro part of town. As soon as we sat down in a booth, Len borrowed all the nickels I had, put them in the jukebox and pressed the levers for a lot of old Louie Armstrong records.

"Sorry, kid," he said. "I know how you hate this real jazzy stuff, but can't have a reunion without music, and there isn't a polka or cowboy ballad or hillbilly stomp in the box. They lack the folksy touch on this side of the tracks." Len has always been very snobbish about my interest in folk music.

I asked him what he'd been doing during the day.

"Lushing it up," he said. "Getting stinking from drinking." He still likes to use the most flamboyant slang; I consider it an infantile form of protest against what he regards as the "genteel" manner of academic people. "I got sort of restless this morning, so I ducked out and beat it into New York and looked up my friend Steve Lundy in the Village. Spent the afternoon liquidating our joint assets. Liquidating our assets in the joints."

What, I wanted to know, was he feeling restless about?

"Restless for going on three years now." His face grew solemn, as though he were thinking it over very carefully. "I'll amend that statement. Hell with the Aesopian language. I've been a plain lush for going on three years. Ever since——"

If it was something personal—I suggested.

"It is *not* something personal," he said, mimicking me. "Guess I can tell an old cyberneticist pal about it. Been a lush for three years because I've been scared for three years. Been scared for three years because three years ago I saw a machine beat a man at a game of chess."

A machine that plays chess? That was interesting, I said.

"Didn't tell you the whole truth the other day," Len mumbled. "I *did* work on the Remington-Rand computer, sure, but I didn't come to IFACS directly from that. In between I spent a couple years at the Bell Telephone Labs. Claude Shannon—or, rather, to begin with there was Norbert Wiener back at M.I.T.—it's complicated . . ."

"Look," I said, "are you sure you want to talk about it?"

"Stop wearing your loyalty oath on your sleeve," he said belligerently. "Sure I want to talk about it. Greatest subject I know. Begin at the beginning. Whole thing started back in the Thirties with those two refugee mathematicians who used to be here at the Institute for Advanced Studies when Einstein was around. Von Morgan and Neumanstern, no, Von *Neu*mann and *Mor*ganstern. You remember, they did a mathematical analysis of all the possible kinds of games, poker, tossing pennies, chess, bridge, everything, and they wrote up their findings in a volume you certainly know, *The Theory of Games.*

"Well, that got Wiener started. You may remember that when he founded the science of cybernetics, he announced that on the basis of the theory of games, it was feasible to design a robot computing machine that would play a better than average game of chess. Right after that, back in '49 or maybe it was '50, Claude Shannon of the Bell Labs said Wiener wasn't just talking, and to prove it he was going to *build* the robot chess player. Which he proceeded withforth—forthwith—to do.

Sometime in '53, I was taken off the Remington-Rand project and assigned to Bell to work with him."

"Maybe we ought to start back," I cut in. "I've got a lot of work to do."

"The night is young," he said, "and you're so dutiful. Where was I? Oh yes, Bell. At first our electronic pawn-pusher wasn't so hot—it could beat the pants off a lousy player, but an expert just made it look silly. But we kept improving it, see, building more and more electronic anticipation and gambit-plotting powers into it, and finally, one great day in '55, we thought we had all the kinks ironed out and were ready for the big test. By this time, of course, Washington had stepped in and taken over the whole project.

"Well, we got hold of Fortunescu, the world's champion chess player, sat him down and turned the robot loose on him. For four hours straight we followed the match, with a delegation of big brass from Washington, and for four hours straight the machine trounced Fortunescu every game. That was when I began to get scared. I went out that night and got really loaded."

What had he been so scared about? It seemed to me he should have felt happy.

"Listen, Ollie," he said, "for Christ's sake, stop talking like a Boy Scout for once in your life."

If he was going to insult me——

"No insult intended. Just listen. I'm a terrible chess player. Any five-year-old could chatemeck—checkmate—me with his brains tied behind his back. But this machine which I built, helped build, is the champion chess player of the world. In other words, my brain has given birth to a brain which can do

things my brain could never do. Don't you find that terrifying?"

"Not at all," I said. "*You* made the machine, didn't you? Therefore, no matter what it does, it's only an extension of you. You should feel proud to have devised a powerful new tool."

"Some tool," he sneered. He was so drunk by now that I could hardly understand what he was saying. "The General Staff boys in Washington were all hopped up about that little old tool, and for a plenty good reason—they understood that mechanized warfare is only the most complicated game the human race has invented so far, an elaborate form of chess which uses the population of the world for pawns and the globe for a chessboard. They saw, too, that when the game of war gets this complex, the job of controlling and guiding it becomes too damned involved for any number of human brains, no matter how nimble.

"In other words, my beamish Boy Scout, modern war needs just this kind of strategy tool; the General Staff has to be mechanized along with everything else. So the Pentagon boys set up IFACS and handed us a top-priority cybernetics project: to build a superduper chess player that could oversee a complicated military maneuver, maybe later a whole campaign, maybe ultimately a whole global war.

"We're aiming at a military strategy machine which can digest reports from all the units on all the fronts and from moment to moment, on the basis of that steady stream of information, grind out an elastic overall strategy and dictate concrete tactical directives to all the units. Wiener warned this might happen, and he was right. A very nifty tool. Never mind how far we've gotten with the thing, but I will tell you this: I'm a lot more scared today than I was three years ago."

So *that* was the secret of MS! The most extraordinary machine ever devised by the human mind! It was hard to conceal the thrill of excitement I felt, even as a relative outsider.

"Why all the jitters?" I said. "This could be the most wonderful tool ever invented. It might eliminate war altogether."

Len was quiet for a while, gulping his beer and looking off into space. Then he turned to me.

"Steve Lundy has a cute idea," he said. "He was telling me about it this afternoon. He's a bum, you see, but he's got a damned good mind and he's done a lot of reading. Among other things, he's smart enough to see that once you've got your theory of games worked out, there's at least the logical possibility of converting your Eniac into what he calls a Strategy Integrator and Computer. And he's guessed, simply from the Pentagon's hush-hush policy about it, that that's what we're working on here at IFACS. So he holds forth on the subject of Emsiac, and I listen."

"What's his idea?" I asked.

"He thinks Emsiac might eliminate war, too, but not in the way a Boy Scout might think. What he says is that all the industrialized nations must be working away like mad on Emsiac, just as they did on the atom bomb, so let's assume that before long all the big countries will have more or less equal MS machines. All right. A cold war gets under way between countries A and B, and pretty soon it reaches the showdown stage. Then both countries plug in their Emsiacs and let them calculate the date on which hostilities should begin. If the machines are equally efficient, they'll hit on the same date. If there's a slight discrepancy, the two countries can work out a compromise date by negotiation.

"The day arrives. A's Emsiac is set up in its capital, B's is set

up in *its* capital. In each capital the citizens gather around their strategy machine, the officials turn out in high hats and cut-aways, there are speeches, pageants, choral singing, mass dancing—the ritual can be worked out in advance. Then, at an agreed time, the crowds retreat to a safe distance and a committee of the top cyberneticists appears. They climb into planes, take off and—this is beautiful—drop all their atom bombs and H-bombs on the machines. It happens simultaneously in both countries, you see. That's the neat part of it. The occasion is called International Mushroom Day.

"Then the cyberneticists in both countries go back to their vacuum tubes to work on another Emsiac, and the nuclear physicists go back to their piles to build more atom bombs, and when they're ready they have another Mushroom Day. One Mushroom Day every few years, whenever the diplomatic-strategic situation calls for it, and nobody even fires a B-B gun. Scientific war. Isn't it wonderful?"

By the time Len finished this peculiar speech, I'd finally managed to get him out of the tavern and back into his car. I started to drive him back to the Institute, my ears still vibrating with the hysterical yelps of Armstrong's trumpet. I'll never for the life of me understand what Len sees in that kind of music. It seems to me such an unhealthy sort of expression.

"Lundy's being plain silly," I couldn't help saying. "What guarantee has he got that on your Mushroom Day, Country B wouldn't make a great display of destroying one Emsiac and one set of bombs while it had others in hiding? It's too great a chance for A to take—she might be throwing away all her defenses and laying herself wide open to attack."

"See what I mean?" Len muttered. "You're a Boy Scout."

Then he passed out, without saying a word about Marilyn. Hard to tell if he sees anything of her these days. He *does* see some pretty peculiar people, though. I'd like to know more about this Steve Lundy.

November 2, 1959

I've done it! Today I split up the lab into two entirely independent operations, K and N. Did it all on my own authority, haven't breathed a word about it to the boss yet. Here's my line of reasoning.

On the K end, we can get results, and fast: if it's just a matter of building a pro that works like the real leg, regardless of what *makes* it work, it's a cinch. But if it has to be worked by the brain, through the spinal cord, the job is just about impossible. Who knows if we'll ever learn enough about neuro tissue to build our own physico-chemico-electrical substitutes for it?

As I proved in my robot moths and bedbugs, I can work up electronic circuits that seem to duplicate one particular function of animal nerve tissue—one robot is attracted to light like a moth, the other is repelled by light like a bedbug—but I don't know how to go about duplicating the tissue itself in all its functions. And until we can duplicate nerve tissue, there's no way to provide our artificial limbs with a neuromotor system that can be hooked up with the central nervous system. The best I can do along those lines is ask Kujack to kick and get a wriggle of the big toe instead.

So the perspective is clear. Mechanically, kinesthetically, motorically, I can manufacture a hell of a fine leg. Neurally, it would take decades, centuries maybe, to get even a reasonable

facsimile of the original—and maybe it will never happen. It's not a project I'd care to devote my life to. If Len Ellsom had been working on that sort of thing, he wouldn't have gotten his picture in the paper so often, you can be sure.

So, in line with this perspective, I've divided the whole operation into two separate labs, K-Pro and N-Pro. I'm taking charge of K-Pro myself, since it intrigues me more and I've got these ideas about using solenoids to get lifelike movements. With any kind of luck I'll soon have a peach of a mechanical limb, motor-driven and with its own built-in power plant, operated by push-button. Before Christmas, I hope.

Got just the right man to take over the neuro lab—Goldweiser, my assistant. I weighed the thing from every angle before I made up my mind, since his being Jewish makes the situation very touchy: some people will be snide enough to say I picked him to be a potential scapegoat. Well, Goldweiser, no matter what his origins may be, is the best neuro man I know.

Of course, personally—although my personal feelings don't enter into the picture at all—I *am* just a bit leary of the fellow. Have been ever since that first log-cutting expedition, when he began to talk in such a peculiar way about needing to relax and then laughed so hard at Len's jokes. That sort of talk always indicates to me a lack of reverence for your job: if a thing's worth doing at all, etc.

Of course, I don't mean that Goldweiser's cynical attitude has anything to do with his being Jewish; Len's got the same attitude and he's *not* Jewish. Still, this afternoon, when I told Goldweiser he's going to head up the N-Pro lab, he sort of bowed and said, "That's quite a promotion. I always did want to be God."

I didn't like that remark at all. If I'd had another neuro man

as good as he is, I'd have withdrawn the promotion immediately. It's his luck that I'm tolerant, that's all.

November 6, 1959

Lunch with Len today, at my invitation. Bought him several martinis, then brought up Lundy's name and asked who he was, he sounded interesting.

"Steve?" Len said. "I roomed with him my first year in New York."

I asked what Steve did, exactly.

"Reads, mostly. He got into the habit back in the 30s, when he was studying philosophy at the University of Chicago. When the Civil War broke out in Spain, he signed up with the Lincoln Brigade and went over there to fight, but it turned out to be a bad mistake. His reading got him in a lot of trouble, you see; he'd gotten used to asking all sorts of questions, so when the Moscow Trials came along, he asked about them. Then the N.K.V.D. began to pop up all over Spain, and he asked about *it*.

"His comrades, he discovered, didn't like guys who kept asking questions. In fact, a couple of Steve's friends who had also had an inquiring streak were found dead at the front, shot in the *back,* and Steve got the idea that he was slated for the same treatment. It seemed that people who asked questions were called saboteurs, Trotskyite-Fascists or something, and they kept dying at an alarming rate."

I ordered another martini for Len and asked how Steve had managed to save himself.

"He beat it across the mountains into France," Len explained. "Since then he's steered clear of causes. He goes to sea

once in a while to make a few bucks, drinks a lot, reads a lot, asks some of the shrewdest questions I know. If he's anything you can put a label on, I'd say he was a touch of Rousseau, a touch of Tolstoi, plenty of Voltaire. Come to think of it, a touch of Norbert Wiener too. Wiener, you may remember, used to ask some damned iconoclastic questions for a cyberneticist. Steve knows Wiener's books by heart."

Steve sounded like a very colorful fellow, I suggested.

"Yep," Len said. "Marilyn used to think so." I don't think I moved a muscle when he said it; the smile didn't leave my face. "Ollie," Len went on, "I've been meaning to speak to you about Marilyn. Now that the subject's come up——"

"I've forgotten all about it," I assured him.

"I still want to set you straight," he insisted. "It must have looked funny, me moving down to New York after commencement and Marilyn giving up her job in the lab and following two days later. But never mind *how* it looked. I never made a pass at her all that time in Boston, Ollie. That's the truth. But she was a screwy, scatterbrained dame and she decided she was stuck on me because I dabbled in poetry and hung around with artists and such in the Village, and she thought it was all so glamorous. I didn't have anything to do with her chasing down to New York, no kidding. You two were sort of engaged, weren't you?"

"It really doesn't matter," I said. "You don't have to explain." I finished my drink. "You say she knew Lundy?"

"Sure, she knew Lundy. She also knew Kram, Rossard, Broyold, Boster, De Kroot and Hayre. She knew a whole lot of guys before she was through."

"She always was sociable."

"You don't get my meaning," Len said. "I am not talking

about Marilyn's gregarious impulses. Listen. First she threw herself at me, but I got tired of her. Then she threw herself at Steve and *he* got tired of her. Damn near the whole male population of the Village got tired of her in the next couple years."

"Those were troubled times. The war and all."

"They were troubled times," Len agreed, "and she was the source of a fair amount of the trouble. You were well rid of her, Ollie, take my word for it. God save us from the intense Boston female who goes bohemian—the icicle parading as the torch."

"Just as a matter of academic curiosity," I said as we were leaving, "what became of her?"

"I don't know for sure. During her Village phase she decided her creative urge was hampered by compasses and T-squares, and in between men she tried to do a bit of painting—very abstract, very imitative-original, very hammy. I heard later that she finally gave up the self-expression kick, moved up to the East Seventies somewhere. If I remember, she got a job doing circuit designing on some project for I.B.M."

"She's probably doing well at it," I said. "She certainly knew her drafting. You know, she helped lay out the circuits for the first robot bedbug I ever built."

November 19, 1959

Big step forward, if it isn't unseemly to use a phrase like that in connection with Pro research. This afternoon we completed the first two experimental models of my self-propelled solenoid legs, made of transparent plastic so everything is visible—solenoids, batteries, motors, thyratron tubes and transistors.

Kujack was waiting in the fitting room to give them their first tryout, but when I got there I found Len sitting with him.

There were several empty beer cans on the floor and they were gabbing away a mile a minute.

Len *knows* how I hate to see people drinking during working hours. When I put the pros down and began to rig them for fitting, he said conspiratorially, "Shall we tell him?"

Kujack was pretty crocked, too. "Let's tell him," he whispered back. Strange thing about Kujack, he hardly ever says a word to me, but he never closes his mouth when Len's around.

"All right," Len said. "*You* tell him. Tell him how we're going to bring peace on Earth and good will toward bedbugs."

"We just figured it out," Kujack said. "What's wrong with war. It's a steamroller."

"Steamrollers are very undemocratic," Len added. "Never consult people on how they like to be flattened before flattening them. They just go rolling along."

"Just go rolling, they go on rolling along," Kujack said. "Like Old Man River."

"What's the upshot?" Len demanded. "People get upshot, shot up. In all countries, all of them without exception, they emerge from the war spiritually flattened, a little closer to the insects—like the hero in that Kafka story who wakes up one morning to find he's a bedbug, I mean beetle. All because they've been steamrolled. Nobody consulted them."

"Take the case of an amputee," Kujack said. "Before the land mine exploded, it didn't stop and say, 'Look, friend, I've got to go off; that's my job. Choose which part you'd prefer to have blown off—arm, leg, ear, nose, or what-have-you. Or is there somebody else around who would relish being clipped more than you would? If so, just send him along. I've got to do some clipping, you see, but it doesn't matter much which part of which guy I clip, so long as I make my quota.' Did the

land mine say that? No! The victim wasn't consulted. Consequently he can feel victimized, full of self-pity. We just worked it out."

"The whole thing," Len said. "If the population had been polled according to democratic procedure, the paraplegia and other maimings could have been distributed to each according to his psychological need. See the point? Marx corrected by Freud, as Steve Lundy would say. Distribute the injuries to each according to his need—not his economic need, but his masochistic need. Those with a special taste for self-damage obviously should be allowed a lion's share of it. That way nobody could claim he'd been victimized by the steamroller or got anything he didn't ask for. It's all on a voluntary basis, you see. Democratic."

"Whole new concept of war," Kujack agreed. "Voluntary amputeeism, voluntary paraplegia, voluntary everything else that usually happens to people in a war. Just to get some human dignity back into the thing."

"Here's how it works," Len went on. "Country A and Country B reach the breaking point. It's all over but the shooting. All right. So they pool their best brains, mathematicians, actuaries, strategists, logistics geniuses, and all. What am I saying? They pool their best *robot* brains, their Emsiacs. In a matter of seconds they figure out, down to the last decimal point, just how many casualties each side can be expected to suffer in dead and wounded, and then they break down the figures. Of the wounded, they determine just how many will lose eyes, how many arms, how many legs, and so on down the line. Now—here's where it gets really neat—each country, having established its quotas in dead and wounded of all categories, can send out a call for volunteers."

"Less messy that way," Kujack said. "An efficiency expert's war. War on an actuarial basis."

"You get exactly the same results as in a shooting war," Len insisted. "Just as many dead, wounded and psychologically messed up. But you avoid the whole steamroller effect. A tidy war, war with dispatch, conceived in terms of ends rather than means. The end never did justify the means, you see; Steve Lundy says that was always the great dilemma of politics. So with one fool sweep—fell swoop—we get rid of means entirely."

"As things stand with me," Kujack said, "if *anything* stands with me, I might get to feeling sore about what happened to me. But nothing happens *to* the volunteer amputee. He steps up to the operating table and says, 'Just chop off one arm, Doc, the left one, please, up to the elbow if you don't mind, and in return put me down for one-and-two-thirds free meals daily at Longchamps and a plump blonde every Saturday.' "

"Or whatever the exchange value for one slightly used left arm would be," Len amended. "That would have to be worked out by the robot actuaries."

By this time I had the pros fitted and the push-button controls installed in the side pocket of Kujack's jacket.

"Maybe you'd better go now, Len," I said. I was very careful to show no reaction to his baiting. "Kujack and I have some work to do."

"I hope you'll make him a moth instead of a bedbug," Len said as he got up. "Kujack's just beginning to see the light. Be a shame if you give him a negative tropism to it instead of a positive one." He turned to Kujack, wobbling a little. "So long, kid. I'll pick you up at seven and we'll drive into New York to have a few with Steve. He's going to be very happy to hear we've got the whole thing figured out."

I spent two hours with Kujack, getting him used to the extremely delicate push-button controls. I must say that, drunk or sober, he's a very apt pupil. In less than two hours he actually walked! A little unsteadily, to be sure, but his balance will get better as he practices and I iron out a few more bugs, and I *don't* mean bedbugs.

For a final test, I put a little egg cup on the floor, balanced a football in it, and told Kujack to try a place kick. What a moment! He booted that ball so hard, it splintered the mirror on the wall.

November 27, 1959

Long talk with the boss. I gave it to him straight about breaking up the lab into K-Pro and N-Pro, and about there being little chance that Goldweiser would come up with anything much on the neuro end for a long, long time. He was awfully let down, I could see, so I started to talk fast about the luck I'd been having on the kinesthetic end. When he began to perk up, I called Kujack in from the corridor and had him demonstrate his place kick.

He's gotten awfully good at it this past week.

"If we release the story to the press," I suggested, "this might make a fine action shot. You see, Kujack used to be one of the best kickers in the Big Ten, and a lot of newspapermen will still remember him." Then I sprang the biggest news of all. "During the last three days of practice, sir, he's been consistently kicking the ball twenty, thirty and even forty yards farther than he ever did with his own legs. Than anybody, as a matter of fact, ever has with real legs."

"That's a wonderful angle," the boss said excitedly. "A world's record, made with a cybernetic leg!"

"It should make a terrific picture," Kujack said. "I've also been practicing a big, broad, photogenic grin." Luckily the boss didn't hear him—by this time he was bending over the legs, studying the solenoids.

After Kujack left, the boss congratulated me. Very, *very* warmly. It was a most gratifying moment. We chatted for a while, making plans for the press conference, and then finally he said, "By the way, do you happen to know anything about your friend Ellsom? I'm worried about him. He went off on Thanksgiving and hasn't been heard from at all ever since."

That was alarming, I said. When the boss asked why, I told him a little about how Len had been acting lately, talking and drinking more than was good for him. With all sorts of people. The boss said that confirmed his own impressions.

I can safely say we understood each other. I sensed a very definite rapport.

November 30, 1959

It was bound to happen, of course. As I got it from the boss, he decided after our talk that Len's absence needed some looking into, and he tipped off Security about it. A half dozen agents went to work on the case and right off they headed for Steve Lundy's apartment in the Village and, sure enough, there was Len.

Len and his friend were both blind drunk and there were all sorts of incriminating things in the room—lots of peculiar books and pamphlets, Lundy's identification papers from the Lincoln Brigade, an article Lundy was writing for an anarchist-pacifist magazine about what he calls Emsiac. Len and his friend were

both arrested on the spot and a full investigation is going on now.

The boss says that no matter whether Len is brought to trial or not, he's all washed up. He'll never get a job on any classified cybernetics project from now on, because it's clear enough that he violated his loyalty oath by discussing MS all over the place.

The Security men came around to question me this morning. Afraid my testimony didn't help Len's case any. What could I do? I had to own up that, to my knowledge, Len had violated Security on three counts: he'd discussed MS matters with Kujack in my presence, with Lundy (according to what he told me), and of course with *me* (I am technically an outsider, too). I also pointed out that I'd tried to make him shut up, but there was no stopping him once he got going. Damn that Len, anyhow. Why does he have to go and put me in this ethical spot? It shows a lack of consideration.

These Security men can be *too* thorough. Right off they wanted to pick up Kujack as well.

I got hold of the boss and explained that if they took Kujack away we'd have to call off our press conference, because it would take months to fit and train another subject.

The boss immediately saw the injustice of the thing, stepped in and got Security to calm down, at least until we finish our demonstration.

December 23, 1959

What a day! The press conference this afternoon was *something*. Dozens of reporters and photographers and newsreel men showed up, and we took them all out to the football field

for the demonstrations. First the boss gave a little orientation talk about cybernetics being teamwork in science, and about the difference between K-Pro and N-Pro, pointing out that from the practical, humanitarian angle of helping the amputee, K is a lot more important than N.

The reporters tried to get in some questions about MS, but he parried them very good-humoredly, and he said some nice things about me, some very nice things indeed.

Then Kujack was brought in. He really went through his paces, walking, running, skipping, jumping and everything. It was damned impressive. And then, to top off the show, Kujack place-kicked a football ninety-three yards by actual measurement, a world's record, and everybody went wild.

Afterward Kujack and I posed for the newsreels, shaking hands while the boss stood with his arms around us. They're going to play the whole thing up as IFACS' Christmas present to one of our gallant war heroes (just what the boss wanted: he figures this sort of thing makes IFACS sound so much less grim to the public), and Kujack was asked to say something in line with that idea.

"I never could kick this good with my real legs," he said, holding my hand tight and looking straight at me. "Gosh, this is just about the nicest Christmas present a fellow could get. Thank you, Santa."

I thought he was overdoing it a bit toward the end there, but the newsreel men say they think it's a great sentimental touch.

Goldweiser was in the crowd, and he said, "I only hope that when *I* prove I'm God, this many photographers will show up." That's just about the kind of remark I'd expect from Goldweiser.

Too bad the Security men are coming for Kujack tomorrow.

The boss couldn't argue. After all, they were patient enough to wait until after the tests and demonstration, which the boss and I agree was white of them. It's not as if Kujack isn't deeply involved in this Ellsom-Lundy case. As the boss says, you can tell a man by the company, etc.

December 25, 1959

Spent the morning clipping pictures and articles from the papers; they gave us *quite* a spread. Late in the afternoon I went over to the boss's house for eggnogs, and I finally got up the nerve to say what's been on my mind for over a month now. Strike while the iron's, etc.

"I've been thinking, sir," I said, "that this solenoid system I've worked out for Pros has other applications. For example, it could easily be adapted to some of the tricky mechanical aspects of an electronic calculator." I went into some of the technical details briefly, and I could see he was interested. "I'd like very much to work on that, now that K-Pro is licked, more or less. And if there *is* an opening in MS——"

"You're a go-getter," the boss said, nodding in a pleased way. He was looking at a newspaper lying on the coffee table; on the front page was a large picture of Kujack grinning at me and shaking my hand. "I like that. I can't promise anything, but let me think about it."

I think I'm in!

December 27, 1959

Sent the soup-and-fish out to be cleaned and pressed. Looks like I'm going to get some use out of it, after all. We're having

a big formal New Year's Eve party in the commons room and there's going to be square dancing, swing-your-partner, and all of that. When I called Marilyn, she sounded very friendly—she remembered to call me Oliver, and I was flattered that she did—and said she'd be delighted to come. Seems she's gotten very fond of folk dancing lately.

Gosh, it'll be good to get out of these dungarees for a while. I'm happy to say I still look good in formals. Marilyn ought to be quite impressed. Len always wore his like pajamas.

—BERNARD WOLFE

With the great corporations virtually ruling the world it was now possible for private industry to go ahead with the development of thinking functional robots.

DEADLOCK

by Lewis Padgett

THOR was the first robot who didn't go mad. It might have been better had he followed the example of his forerunners.

The trouble, of course, lay in creating a sufficiently complicated thinking machine that wouldn't be *too* complicated. Balder IV was the first robot that could be called successful, and after three months he began to behave erratically, giving the wrong answers and spending most of his time staring blankly at nothing. When he became actually destructive, the Company took steps. Naturally, it was impossible to destroy a duraloy-constructed robot, but they buried Balder IV in concrete. Before the stuff had set, it was necessary to throw Mars II after him.

The robots worked—yes. For a time. Then there was an ambiguous sort of mental breakdown, and they cracked up. The Company couldn't even salvage the parts—a blowtorch couldn't melt plastic duraloy after it had hardened, and so twenty-eight robots, thinking lunatic thoughts, reposed in beds of cement, reminding Chief Engineer Harnahan of Reading Gaol.

"And their grave has no name," Harnahan amplified, lying

full length on the couch in his office and blowing smoke rings.

He was a big man with tired eyes and a perpetually worried frown. No wonder, in this day of gigantic corporations that fought each other tooth and nail for economic supremacy. It was vaguely feudal, for if a company went under, it was annexed by its conqueror, and *vae victis*.

Van Damm, who was more of a trouble-shooter than anything else, sat on the edge of the desk, biting his nails. Small, gnomish, and dark as a Pict, his shrewd wrinkled face was as impassive as that of Thor, who stood motionless against the wall. Now Van Damm looked at the robot.

"How do you feel?" he asked. "Any sign of a mental crack-up?"

Thor said, "Mentally I am in fine shape, ready to cope with any problem."

Harnahan turned over on his stomach. "O.K. Cope with this, then. Luxingham Incorporated swiped Dr. Sadler and his formula for increasing the tensile strength of mock-iron. The louse was holding out on us for a bigger salary. Now he's taken a run-out powder and gone over to Luxingham."

Thor nodded. "Contract?"

"Fourteen-X-Seven. The usual metallurgist's contract. Technically unbreakable."

"The courts would uphold us. However, by this time Luxingham's facial surgeons would have altered Sadler's body and fingerprints. The case would run . . . two years. By that time Luxingham would have made sufficient use of the mock-iron formula."

Van Damm made a horrible face. "Solution, Thor." He shot a quick glance at Harnahan. Both men knew what was coming. Thor didn't disappoint them.

"Force," the robot remarked. "You need the formula. A robot is not legally responsible—as yet. I'll visit Luxingham."

"O.K.," Harnahan said reluctantly, and Thor turned and went out. The chief engineer scowled.

"Yeah," Van Damm nodded. "I know. He'll just walk in and snaffle the formula. And we'll get another injunction against operating an uncontrollable machine. And we'll keep on just as we have been doing."

"Is brute force the best logic?" Harnahan wondered.

"The simplest, maybe. Thor doesn't need to work out complicated legal methods. He's indestructible. He'll just walk into Luxingham and take the formula. If the courts decide Thor's dangerous, we can bury him in cement and make more robots. He's without ego, you know. It won't matter to him."

"We expected more," Harnahan grumbled. "A thinking machine ought to be able to do a lot."

"Thor can do a lot. So far, he hasn't gone crazy like the others. He's solved every problem we've given him—even that trend chart that had everyone else buffaloed."

Harnahan nodded. "Yeah. He predicted Snowmany's election . . . that got the Company out of a scrape. He can think, all right. For my money, there's no problem he can't solve. Just the same, he isn't inventive."

"If the occasion arose——" Van Damm went off at a tangent. "We've got the monopoly on robots, anyhow. Which is something. It's about time to give the go-ahead signal on more robots of Thor's type."

"Better wait a bit. See if Thor goes crazy. He's the most complicated one so far."

The visiphone on the desk came to life with an outraged screech. "Harnahan! You lousy, unethical murderer! You——"

"I'm recording that, Blake," the engineer called as he stood up. "You'll get a libel suit slammed on you within the hour."

"Sue and be damned," Blake of Luxingham Incorporated yelled. "I'm coming over and break your prognathous jaw myself! So help me, I'll burn you down and spit on the ashes!"

"Now he's threatening my life," Harnahan said in a loud aside to Van Damm. "Lucky I'm recording this on the tape."

Blake's crimson face on the screen seemed to swell visibly. Before it burst, however, another portrait took its place—the smooth, bland countenance of Marshal Yale, police administrator to the sector. Yale looked worried.

"Look, Mr. Harnahan," he said sadly, "this can't keep up. Now just look at things sensibly, will you? After all, I'm an officer of the law——"

"Ha!" remarked Van Damm, *sotto voce*.

"—and outright mayhem is something I can't condone. Maybe your robot's gone mad?" he added hopefully.

"Robot?" Harnahan asked, his face blank. "I don't understand. What robot's that?"

Yale sighed. "Thor. Thor, of course. Who else? Now I realize you don't know a thing about it"—his voice was as heavily sarcastic as he dared to make it—"but Thor has just walked into Luxingham and played merry hell."

"No!"

"Yes. He walked right in. The guards tried to stop him, but he just kept on going. He stepped on 'em, in fact. They played a flame hose on him, but he didn't stop for that. Luxingham got out every defense weapon in their arsenal, and that infernal robot of yours simply kept on going. He grabbed Blake by the neck and made him unlock the lab door. And he took a formula away from one of the technicians."

"I *am* surprised," Harnahan said, shocked. "By the way, which technician was it? Not a guy named Sadler?"

"I dunno . . . wait a minute. Yes, Sadler."

"But Sadler's working for us," the engineer explained. "We've got him on a beryl-bound contract. Any formulas he works out belong to us."

Yale mopped his shining cheeks. "Mr. Harnahan, please!" he said desperately. "If you'd only think of the spot I'm in! Legally I'm bound to do something about this. You can't let one of your robots try strong-arm stuff like that. It's too . . . too——"

"Obvious?" Harnahan suggested. "Well, as I say, it's all news to me. I'll check up and call you back. By the way, I'm preferring charges against Blake. Libel, and homicidal threats."

"Oh, my God," Yale said, and broke the beam.

Van Damm and Harnahan exchanged delighted glances.

"Fair enough," the gnomish trouble-shooter chuckled. "It's deadlock. Blake won't try bombing us—we've both got too many antiaircraft defenses—so it'll go to the courts. Courts!" He pursed his mouth wryly.

Harnahan returned to the couch. "Best thing we ever did was to concentrate on those robots. Within ten years the Company will own the world. And other worlds. We can send out spaceships, with robot operators."

The door opened, and Thor appeared, looking none the worse for his ordeal. He put a slip of metal-plaque on the desk.

"Formula for mock-iron."

"Hurt?"

"Impossible."

Thor went to a filing cabinet, secured an envelope, and vanished again. Harnahan rose to study the plaque.

"Yeah. This is it." He slipped it into a conveyor slot. "Things are too easy sometimes. Guess I'll knock off for the day. Say! What was Thor up to just now?"

Van Damm looked at him. "Eh?"

"At the files. What's on his mind?" Harnahan investigated. "Some electronic thesis—I don't know what he wanted with that. Perhaps he's going to do some research on his own."

"Maybe," Van Damm said. "Let's go see."

They took a dropper to the robot's workshop in the basement, but the room was empty. Harnahan used the teleview.

"Check-up. Where's Thor?"

"One moment, sir. . . . In the Seven Foundry. Shall I connect you with the foreman?"

"Yeah. Ivar? What's Thor up to?"

Ivar rubbed his bullet head. "Damfino. He ran in, grabbed a tensile chart, and ran out again. Wait a bit. He's back again."

"Let me talk to him," Harnahan said.

"Sure——" Ivar's crazy face vanished, and presently reappeared. "No soap. He picked up a chunk of syntho-plat and went."

"Hm-m-m," Van Damm put in. "Do you suppose——"

"He's going crazy like the others?" Harnahan scowled. "They didn't act like that. Still, it's possible."

Just then Thor appeared, his rubbery arms laden with an incongruous array of practically everything. Ignoring the two men, he dumped the stuff on a bench and began to rearrange it, working with swift accuracy.

"He isn't crazy," Harnahan said. "The light's on."

In Thor's forehead was a crimson stud that lighted whenever the robot was working on a problem. It was a new improve-

ment, a telltale for robot-madness. Had it been flashing intermittently there would have been something to worry about—mixing a fresh batch of concrete to provide a grave for a crazy robot.

"Thor!" Van Damm said sharply. The robot didn't reply.

"Must be a big problem," Harnahan frowned. "Wonder what it is?"

"I'm wondering what gave him the idea," the trouble-shooter said. "Something that occurred lately, that's certain. An improvement on the mock-iron process?"

"Possibly. Hm-m-m." They watched the busy robot for a while, learning nothing; and finally went back to Harnahan's office, where they had a drink, and speculated on what Thor was inventing. Van Damm thought it would be a mock-iron improvement. Harnahan didn't agree, but had no better ideas.

Matters were not clarified when the teleview announced that there had been an explosion in the basement.

"Atomic energy!" Harnahan gulped, rising from the couch in one jerky motion. Van Damm was at his heels as they sped toward the dropper. In the basement, a knot of men was gathered around the door to Thor's workshop.

Harnahan pushed through them and stepped across the threshold into a cloud of concrete dust. As it cleared, he saw the disjointed remains of Thor at his feet. The robot was obviously beyond repair.

"Funny!" Harnahan muttered. "That wasn't an especially severe explosion. If it wrecked Thor, it should have wrecked the plant—or the basement anyway. His duraloy's half melted."

Van Damm didn't answer. Harnahan looked up to see the trouble-shooter staring into the clouds of dust at a gadget that hung in midair a few feet away.

It was a gadget—just that. Harnahan recognized several of the parts that Thor had brought into his workshop. But the sum total was rather baffling. The device served no discernible purpose. It looked like the sort of toy an erratic child might construct with a mechano set.

Roughly cylindrical, it was about two feet long, and a foot thick. There was a lens in it, and moving parts, and a helical coil. It buzzed.

That was all.

"Well," Harnahan said, "what in the name of Balaam's ass is it?"

Van Damm carefully stepped back to the remains of the door. He barked hurried commands. Panels slid shut, and a man in blue uniform hurried to the trouble-shooter.

"Blocked off, chief."

"Yeah," Van Damm said. "Use the hypnotic treatment on these boys." He nodded toward the score or so of workmen, and there was a shuffling movement among them.

"Requesting the reason, sir," someone called.

Van Damm grinned at them. "Fair enough. You saw what was left of Thor. If it gets out that one of our indestructible robots can be destroyed, the other companies will get busy. Remember what happened with the old-style robots we made? They were sabotaged—that was why we developed the duraloy robot. It's the only practical kind. We'll just erase from your brains the realization that Thor was burned down. Then Luxingham or the others can't get hold of that info, even if they use scopolamin on you."

Satisfied, the men filed out one by one. Harnahan was still looking blankly at the gadget.

"No switches on the thing," he remarked. "Wonder what activates it?"

"Thought, maybe," Van Damm said. "But be careful. We don't want to start it working till we know what it's for."

"You're talking sense," Harnahan nodded, his face suddenly changing. "I'm only now beginning to realize the implications of this. Thor was supposedly indestructible."

"Nothing is, completely."

"I know. But duraloy—hm-m-m. Look at that lens. Could it be for the purpose of focusing some destructive ray that'd upset the atomic structure of alloys? No. What's left of Thor is still duraloy. It couldn't be that. Still—*look out!*" He dived out of the way as the gadget revolved slowly in midair.

Van Damm ducked toward the door. "You've set it off! Let's get out of here!"

He was too late. The gadget swooped over his head, removing a gray lock in transit, and banged against a metal barrier across the basement. Harnahan and Van Damm stood in the doorway of the robot's room and watched the device slowly eat its way through solid steel.

Presently it vanished.

Harnahan glanced at the teleview behind him. It was broken by the force of the blast. He shivered a little and said, "We'd better follow the thing. Do . . . do you suppose——" He stopped.

Van Damm peered at him sharply. "Uh?"

"Nothing. I guess. But . . . I'm wondering about mechanical mutation."

"You're crazy as a robot," Van Damm said explicitly. "Mechanical fudge!"

"Look, though. When life reaches a crucial point it mutates.

That's a biological law. Suppose Thor created a robot greater than he ever was, and . . . and——"

"That thing," said Van Damm, pointing to the hole in the wall, "is no robot, whatever else it may be. It's a machine. It isn't a thinking machine, either. But it's got power, plenty of that. Our business is to find out how that power should be applied." He hesitated. "Could we run a recording from Thor's brain?"

Harnahan shook his head. "No soap. His brain's burned out. I checked that."

"And robots don't leave notes. Well, it shouldn't be impossible to find out what that gadget does."

"It burns holes through steel, anyway," Harnahan remarked.

"And it stops watches," said Van Damm, glancing at his wrist timepiece. "We might try putting ourselves in the place of a robot and seeing what he'd invent."

Harnahan glared at the trouble-shooter and hurried through a door in the metal barrier. There was no sign of the gadget beyond the threshold. A hole in the ceiling gave the answer.

They went upstairs, and a hall teleview informed them that the gadget was in one of the machine shops, doing nothing. It was still doing nothing when Van Damm and Harnahan arrived. Fifty metal lathes were aligned in neat rows, and the workers were staring up at the floating gadget in a baffled fashion.

The foreman approached. "What is it?" he wanted to know. "One of Luxingham's tricks? Bomb, maybe?"

"What's it done?"

"Nothing much. Only the lathes won't work."

Van Damm seized a long, metal-tipped pole and approached the gadget. It floated slowly away. He maneuvered it into a corner and jabbed it with the pole, with no discernible result. The tone of the buzzing remained unaltered.

"Try the lathes now," Harnahan suggested.

They still didn't work. But the gadget, scenting new worlds to conquer, slid toward a door, burned its way through it, and disappeared.

It was now outside the great building. From the porch that jutted out on the clifflike wall, Harnahan and Van Damm could look up and see the gadget levitating itself smoothly toward the sky. At a point far above them it disappeared, and shards of flexiglass tinkled down as they dodged in.

"Up!" Harnahan said succinctly. "I've a hunch that was Twill's office."

It was unnecessary to say more. Joseph Twill was one of the partners in the Company, a godlike being who dwelt in the rarefied atmosphere of the upper towers.

Alarmed guards let them into Twill's offices. As Harnahan had feared, the worst had happened. The gadget sat cryptically on the big shot's desk, buzzing. Twill himself crouched limply in his chair, glaring at the device. About every three minutes he jerked, went white, and slowly recovered.

Van Damm yanked out his pistol. "Get me an acetylene torch," he snapped, and advanced on the gadget. It slid toward Twill, and the trouble-shooter, circling swiftly, fired. He missed. The gadget rose, hesitated, and then bored down through desk, drawers, carpet, and floor, vanishing with a diminishing buzz.

Twill mopped his face. "What was it?" he managed to ask. "Luxingham? I thought——"

Van Damm looked at Harnahan, who gulped and explained. "We'll destroy it now, though," he finished. "A torch would melt it easily—it isn't duraloy."

Twill had recovered some portion of his poise. "Hold on," he ordered as Harnahan turned toward the door. "Don't destroy it unless you have to. That might mean blowing up a diamond mine. The thing must be valuable, if only for a weapon."

"Did it hurt you?" Van Damm wanted to know.

"Not—exactly. My heart kept constricting—slowing down with a jolt, and then picking up again, regularly."

"It didn't affect me that way," Harnahan said.

"No? Well, if you've got to destroy it, all right. But don't do that unless it seems absolutely necessary. Thor was a smart robot. If we can find out the purpose of the thing——"

Outside, Van Damm and Harnahan looked at each other. Twill was absolutely right, of course. The gadget might be immensely valuable—if it were only possible to learn how. Its appearance was no clue. It had burned through metal, but a torch could do that, or thermite. Its subtle radiations had affected Twill's heart. That led up a blind alley. The gadget couldn't have been created solely in order to render Twill uncomfortable.

It was uncontrolled, not uncontrollable. Yet only Thor had known the reason for building the gadget in the first place.

"We can see what side products it has, and find out if the sum of the parts equals the whole," Harnahan said. "That would be one way of finding out what the whole is."

Van Damm was fumbling with a hall teleview. "Wait a

minute. I want to find out——" He spoke sharply into the mike. Presently he groaned with heartfelt misery.

All the clocks in the plant had stopped. All the delicate instruments were out of kilter. According to the seismograph, a violent earthquake was in progress. According to the barometer, a typhoon was raging. And, to judge by the actions of the atom smasher, all matter was rather impossibly inert.

"Planck," Harnahan said wildly, clutching at a futile straw. "Improbability factor. It reverses the laws of probability——"

"Keep a grip on yourself," Van Damm advised. "You'll be counting your fingers next. We're dealing with cold, logical science. Once we find the key, it'll be as simple as *pi*."

"But we don't know the possible scope of a robot's mind. It might have created anything—something far beyond our understanding."

"The chances are it didn't," Van Damm said practically. "So far the gadget hasn't done anything impossible, in the light of present-day scientific knowledge——"

The televiewchattered hysterically. All the men in Research B-14 had turned into skeletons, and then vanished completely. The gadget had been there, of course.

"X rays," Van Damm said, a bit hoarsely. "I'm going to get that torch, just the same. I'll feel safer."

By the time they had secured the weapon, they learned that the vanished men had reappeared, unharmed by their experience. Meantime, however, the gadget had visited Personnel, frightened a secretary into conniptions, blacked out the fluorescents, and removed the gravity of a huge safe so that it hung from the ceiling, amid crumbling shreds of smashed plastic.

"Now it nullifies gravity," Harnahan said bitterly. "Just try co-integrating that into the pattern. So far we know this: the

gadget nullifies gravity, makes people invisible, stops electric power, and gives Twill a heartache. All it spells to me is nihilism."

"Definitely it's getting worse," Van Damm agreed. "We'll have to catch it before we can even turn the torch on the damn thing." He headed for a dropper, hesitated, and used the nearest teleview. The news was not encouraging. The gadget had got into the commissary and soured all the milk.

"I'd like to let it loose in Luxingham," Harnahan said. "It'd wreck the joint—Lord knows it's trying to wreck *us!* If we only knew how it could be controlled!"

"Telepathically," Van Damm suggested for the second time. "But we don't dare try it. Judging by what the gadget's done already, it'd blow the county into neutrons if we . . . ha! . . . *controlled* it."

"Maybe only a robot can control it," Harnahan said, and snapped his fingers sharply, his face brightening. "Wait a bit! I've got an idea—Thor II!"

"Eh?"

"The second robot built on Thor's model. He's all ready to go—all finished, with a mental library installed. He just needs energizing. That's it, sure. We can't figure out what the gadget's for, but another robot like Thor could. It's perfectly logical, isn't it?"

"Slightly too much so," Van Damm said hesitantly. "Suppose Thor II turns the gadget on us? It might be a device to make robots the supreme ruling species."

"You're the one who's talking crazy now," Harnahan said. He used a teleview to issue orders, and turned away, grinning. Within fifteen minutes Thor II would be in working order, intelligent and ready to cope with any problem.

That quarter of an hour, though, was an unpleasantly hectic one. The gadget, as though demoniacally inspired, tried to visit each separate branch of the gigantic plant. It changed a valuable shipment of gold ingots into dull, comparatively worthless lead. It neatly stripped the clothes from an important customer in the upper tower. It caused all the clocks to begin working again—backward. It revisited the wretched Twill, giving him another heart attack, and causing him to shine with a vague, purplish glow which did not wear off for more than a month thereafter.

It was a goblin, a Puck, a will-o'-the-wisp. By the time the fifteen minutes had elapsed, the Company was in a greater furor than the last time Luxingham had sent bombers over the towers. Long-distance teleview lines hummed frantically. Twill screamed explanations and curses at his partners in New York and Chicago. Technicians and trouble-shooters collided with one another in the halls. A helicopter hovered above, ready to shoot down the gadget if it tried to escape. More than one member of the Company wished to Heaven it *would* try to do just that.

Erratic, unpredictable, and nerve-jolting, the gadget sailed merrily on its way, actually doing very little harm except to upset the entire organization of the Company. Harnahan chewed his nails till Thor II was ready. Then he hastily collected the robot and took a dropper to join Van Damm and his torch on a lower level, where the gadget had last been seen.

Van Damm sent a sharp glance at the robot's face. "He's conditioned and ready?"

"Yeah," Harnahan nodded. "You know what we want, Thor II, don't you?"

The robot said, "Yes. But without seeing the device, I cannot tell you its purpose."

"Fair enough," Van Damm grunted, as a screaming blonde fled past him. "It's probably in this office."

He led the way. The office, naturally enough, was deserted, but the gadget, buzzing faintly, hung in midair in the center of the room. Thor II moved past Harnahan and stood intently regarding the cryptic machine.

"Is it alive?" Harnahan asked softly.

"No."

"Its purpose?"

"Wait. To solve a problem—yes. I do not know if it will solve the problem for which it was created. There is only one way to tell."

Thor II stepped forward. The gadget swung around so that the lens faced toward him. Some instinct warned Harnahan. He heard the buzzing grow in intensity, and simultaneously hurled himself at Van Damm. The two men crashed down behind the desk, the trouble-shooter's portable torch clattering heavily against the wall and falling painfully on Harnahan's legs.

He scarcely felt it. Other things were happening. A lambent, pinkish ray fingered out from the gadget's lens and bathed Thor II. Coincidentally, the buzzing rose to a shrill, nerve-racking whine which did not last long. It ended in a blasting concussion that blinded and deafened the two men and knocked the desk on top of them.

Harnahan coughed rackingly and mumbled something. Somewhat to his surprise, he was still alive. He got up in time to see Van Damm staggering forward, holding the torch, and playing a blazing flame toward the gadget, which made no

attempt to escape. It glowed crimson—and then began to melt. Globules of copper and other metals dripped down on the floor. With a dull thump the gadget—what was left of it—dropped, harmless and insensate.

Van Damm turned off the torch. The low buzzing had stopped.

"Dangerous," he said, looking wildly toward Harnahan. "Got it just in time. You hurt?"

"Just in time!" Harnahan said, pointing. "Look at that!"

Van Damm looked. Thor II had suffered the fate of Thor I. A broken machine, he lay half melted near the door.

Harnahan drew his arm across his cheek and looked at the blackened stain. He leaned on the desk and a slow grin grew on his face. Van Damm watched in amazement.

"What the devil——"

Harnahan was laughing almost hysterically. "It . . . it worked!" he managed to get out. "What a . . . what a shock for the Company! The gadget—worked!"

Van Damm gripped the engineer's shoulders and shook him. Harnahan sobered, though a wry smile still quirked his lips. "O.K.," he said at last. "I . . . I couldn't help it. It's so funny!"

"What is?" the other demanded. "If you can see something funny about this——"

Harnahan gulped. "It—well, it's a deadlock. Haven't you guessed yet what the gadget was for?"

"Death ray of some sort?"

"You missed the point of what Thor II said—that there was only one way to tell whether the gadget could do what it was intended to do."

"Well? What was that?"

Harnahan giggled feebly. "Logic—use logic. Remember the first robots we made? They were all sabotaged, so we built supposedly indestructible ones of duraloy. And the robots were made to solve problems—that was their reason for existence. Everything went along swell until those robots went crazy."

"I know that," Van Damm said impatiently. "What's it got to do with the gadget?"

"They went crazy," Harnahan said, "because they were faced with an insurmountable problem. That's elementary psychology. Thor I faced the same problem, but he solved it."

Slow realization was dawning on Van Damm's face. "Indestructible—no!"

"Sure! Sooner or later, all the duraloy robots thought of a perfectly obvious problem for them—how they themselves could be destroyed. We made 'em that way, so they'd more or less think for themselves. That was the only way to make them satisfactory thinking machines. The robots buried out in the cement faced the problem of their own destruction, couldn't solve it, and went crazy. Thor I was cleverer. He found the answer. But there was only one possible way to test it—on himself!"

"But . . . Thor II——"

"The same thing. He knew the gadget had worked on Thor I, but he didn't know whether it would work on *him*. Robots are coldly logical. They have no instinct of self-preservation. Thor II simply tried out the gadget to see if it would solve his problem." Harnahan swallowed. "It did."

"What are we going to tell Twill?" Van Damm asked blankly.

"What can we tell him? The truth—that we've run into a

blind alley. The only usable robots we can make are duraloy thinking machines, and they'll destroy themselves as soon as they begin to wonder if they're really indestructible. Each one we make will need the ultimate proof—self-destruction. If we cut down their intelligence, they're useless. If we don't use duraloy, Luxingham or some other company will sabotage 'em. Robots are wonderful, sure; but they're born with suicidal tendencies. Van Damm, I very much fear we must tell Twill that the Company's run up a blind alley."

The trouble-shooter groaned. "So that was the real purpose of the gadget, eh? And all those other manifestations were just by-products of an uncontrolled machine."

"Yeah——" Harnahan moved toward the door, skirting the half-melted remains of the robot. He looked down sadly on the ruined creature and sighed.

"Some day, maybe, we can do better. But right now it seems to be a deadlock. We shouldn't have called him Thor," Harnahan added, as he went out into the hall. "Somehow, I think Achilles would have been more appropriate."

Now that earth was unified by a world government and the fear of sabotage gone, Robots, Inc., the last of the great corporations, was able to develop a functioning robot after the discovery of the Verhaeren Factor. This gave the robot mobility, but he was still subject to the commands of man.

ROBINC

by H. H. Holmes

YOU'D think maybe it meant clear sailing after we'd got the Council's O.K. You'd maybe suppose that'd mean the end of our troubles and the end of android robots for the world.

That's what Dugg Quinby thought, anyway. But Quinby may have had a miraculous gift of looking straight at problems and at things and at robots and getting the right answer; but he was always too hopeful about looking straight at people. Because, like I kept saying to him, people aren't straight, not even to themselves. And our future prospects weren't anywhere near as good as he thought.

That's what the Head of the Council was stressing when we saw him that morning just after the Council had passed the bill. His black face was sober—no trace of that flashing white grin that was so familiar on telecasts. "I've put your bill through, boys," he was saying. "God knows I'm grateful—the whole Empire should be grateful to you for helping me put over the renewal of those Martian mining concessions, and the usuform barkeep you made me is my greatest treasure; but I can't help you any more. You're on your own now."

That didn't bother Quinby. He said, "The rest ought to be easy. Once people understand what usuform robots can do for them——"

"I'm afraid, Mr. Quinby, it's you who don't quite understand. Your friend here doubtless does; he has a more realistic slant on things. But you—I wouldn't say you idealize people, but you flatter them. You expect them to see things as clearly as you do. I'm afraid they usually don't."

"But surely when you explained to the Council the advantages of usuforms——"

"Do you think the Council passed the bill only because they saw those advantages? They passed it because I backed it, and because the renewal of the Martian concessions have for the moment put me in a powerful position. Oh, I know, we're supposed to have advanced immeasurably beyond the political corruption of the earlier states; but let progress be what it may, from the cave man on up to the illimitable future, there are three things that people always have made and always will make: love, and music, and politics. And if there's any difference between me and an old-time political leader, it's simply that I'm trying to put my political skill at the service of mankind."

I wasn't listening too carefully to all this. The service of mankind wasn't exactly a hobby of mine. Quinby and the Head were all out for usuforms because they were a service to man and the Empire of Earth; I was in it because it looked like a good thing. Of course you can't be around such a mixture of a saint, a genius, and a moron as Quinby without catching a little of it; but I tried to keep my mind fixed clear on what was in it for me.

And that was plenty. For the last couple of centuries our

civilization had been based on robots—android robots. Quinby's usuform robots—Q.U.R.—robots shaped not as mechanical men, but as independently thinking machines formed directly from their intended function—threatened the whole robot set-up. They were the biggest thing since Zwergenhaus invented the mechanical brain, and I was in on the ground floor.

With the basement shaking under me.

It was an android guard that interrupted the conference here. We hadn't really got started on usuform manufacture yet, and anyway, Quinby was inclined to think that androids might be retained in some places for guards and personal attendants. He said, "Mr. Grew says that you will see him."

The Head frowned. "Robinc has always thought it owned the Empire. Now Mr. Grew thinks he owns me. Well, show him in." As the guard left, he added to us, "This Grew-Quinby meeting has to take place some time. I'd rather like to see it."

The president-owner of Robinc—Robots Incorporated, but nobody ever said it in full—was a quiet old man with silvery hair and a gentle sad smile. It seemed even sadder than usual today. He greeted the Head and then spoke my name with a sort of tender reproach that near hurt me.

"You," he said. "The best trouble-shooter that Robinc ever had, and now I find you in the enemy's camp."

But I knew his technique, and I was armed against being touched by it. "*In* the enemy's camp?" I said. "I *am* the enemy. And it's because I was your best trouble-shooter that I learned the real trouble with Robinc's androids: They don't work, and the only solution is to supersede them."

"Supersede is a kind word," he said wistfully. "But the un-

kind act is destruction. Murder. Murder of Robinc itself, draining the lifeblood of our Empire."

The Head intervened. "Not draining, Mr. Grew, but transfusing. The blood stream, to carry on your own metaphor, is tainted; we want fresh blood, and Mr. Quinby provides it."

"I am not helpless, you know," the old man murmured gently.

"I'm afraid possibly you are, sir, and for the first time in your life. But you know the situation: In the past few months there has been an epidemic of robot breakdowns. Parts unnecessary and unused, but installed because of our absurd insistance on an android shape, have atrophied. Sometimes even the brain has been affected; my own confidential cryptanalyst went totally mad. Quinby's usuforms forestall any such problem."

"The people will not accept them. They are conditioned to androids."

"They must accept them. You know, better than most, the problems of supply that the Empire faces. The conservation of mineral resources is one of our essential aims. And usuforms will need variously from seventy to only thirty per cent of the metal that goes into your androids. This is no mere matter of business rivalry; it is conflict between the old that depletes the Empire and the new that strengthens it."

"And the old must be cast aside and rejected?"

"You," I began, "have, of course, always shown such tender mercy to your business compet——" but Quinby broke in on me.

"I realize, Mr. Grew, that this isn't fair to you. But there are much more important matters than you involved."

"Thank you." The gentle old voice was frigid.

"But I wouldn't feel right if you were simply, as you put it, cast aside and rejected. If you'll come to see us and talk things over, I'm pretty sure we can——"

"Sir!" Sanford Grew rose to his full short height. "I do not ask favors from puppies. I have only one request." He turned to the Head. "The repeal of this ridiculous bill depriving Robinc of its agelong monopoly which has ensured the safety of the Empire."

"I'm sorry, Mr. Grew. That is impossible."

The hair was still silvery and the smile was still sad and gentle. But the words he addressed to us were, "Then you understand that this is war?"

Then he left. I didn't feel too comfortable. Saving the Empire is all very well. Being a big shot in a great new enterprise is swell. But a war with something the size of Robinc is not what the doctor usually orders.

"The poor man," said Quinby.

The Head flashed an echo of the famous grin. "No wonder he's upset. It's not only the threatened loss of power, I heard that yesterday his android cook broke down completely. And you know how devoted he is to unconcentrated food."

Quinby brightened. "Then perhaps we——"

The Head laughed. "Your only hope is that a return to a concentrated diet will poison him. You've no chance of winning over Sanford Grew alive."

We went from there to the Sunspot. "It's funny," Quinby used to say. "I don't much like to drink, but a bar's always good for heavy thinking." And who was I to argue?

Guzub, that greatest of bartenders, spotted us as we came in and had one milk and one straight whiskey poured by the time

we reached our usual back table. He served them to us himself, with a happy flourish of his tentacles.

"What are you so beamish about?" I asked gruffly.

Guzub shut his middle eye in the Martian expression of happiness. "Begauze you boys are going to 'ave a gread zugzezz with your uxuvorm robods and you invended them righd 'ere in the Zunzbod." He produced another tentacle holding a slug of straight vuzd and downed it. "Good lugg!"

I glowered after him. "We need luck. With Grew as our sworn enemy, we're on the——"

Quinby had paper spread out before him. He looked up now, took a sip of milk, and said, "Do you cook?"

"Not much. Concentrates do me most of the time."

"I can sympathize with Grew. I like old-fashioned food myself and I'm fairly good at cooking it. I just thought you might have some ideas."

"For what?"

"Why, a usuform cook, of course. Grew's android cook broke down. We'll present him with a usuform, and that will convert him, too——"

"Convert hell!" I snorted. "Nothing can convert that sweetly smiling old—— But maybe you have got something there; get at a man through his hobby—— Could work."

"Now usually," Quinby went on, "androids break down because they don't use all their man-shaped body. But an android cook would go nuts because man's body isn't enough. I've cooked; I know. So we'll give the usuform more. For instance, give him Martoid tentacles instead of arms. Maybe instead of legs give him an automatic sliding height adjustment to avoid all the bending and stooping, with a roller base for quick movement. And make the tentacles functionally specialized."

I didn't quite get that last, and I said so.

"Half your time in cooking is wasted reaching around for what you need next. We can build in a lot of that stuff. For instance, one tentacle can be a registering thermometer. Tapering to a fine point—stick it in a roast and—— One can end in a broad spoon for stirring—heat-resistant, of course. One might terminate in a sort of hand, of which each of the digits was a different-sized measuring spoon. And best of all—why the nuisance of bringing food to the mouth to taste? Install taste-buds in the end of one tentacle."

I nodded. Quinby's pencil was covering the paper with tentative hookups. Suddenly he paused. "I'll bet I know why android cooks were never too successful. Nobody ever included the Verhaeren factor in their brains."

The Verhaeren factor, if you've studied this stuff at all, is what makes robots capable of independent creative action. For instance, it's used in the robots that turn out popular fiction—in very small proportion, of course.

"Yes, that's the trouble. They never realized that a cook is an artist as well as a servant. Well, we'll give him in his brain what he needs for creation, and in his body the tools he needs to carry it out. And when Mr. Grew has had his first meal from a usuform cook——"

It was an idea, I admitted, that might have worked on anybody but Sanford Grew—get at a man and convert him through what's dearest to his heart. But I'd worked for Grew. I knew him. And I knew that no hobby, not even his passion for unconcentrated food, could be stronger than his pride in his power as president of Robinc.

So while Quinby worked on his usuform cook and our foreman Mike Warren got our dowser ready for the first big

demonstration, I went ahead with the anti-Robinc campaign.

"We've got four striking points," I explained to Quinby. "Android robots atrophy or go nuts; usuforms are safe. Android robots are almost as limited as man in what they can do without tools and accessories; usuforms can be constructed to do anything. Android robots are expensive because you've got to buy an all-purpose one that can do more than you need; usuforms save money because they're specialized. Android robots use up mineral resources; usuforms save them."

"The last reason is the important one," Quinby said.

I smiled to myself. Sure it was, but can you sell the people on anything as abstract as conservation? Hell no. Tell 'em they'll save credits, tell 'em they'll get better service, and you've got 'em signed up already. But tell 'em they're saving their grandchildren from a serious shortage and they'll laugh in your face.

So as usual, I left Quinby to ideas and followed my own judgment on people, and by the time he'd sent the cook to Grew I had all lined up the campaign that could blast Grew and Robinc out of the Empire. The three biggest telecommentators were all sold on usuforms. A major solly producer was set to do a documentary on them. Orders were piling up about twice as fast as Mike Warren could see his way clear to turning them out.

So then came the day of the big test.

We'd wanted to start out with something big and new that no android could possibly compete with, and we'd had the luck to run onto Mike's brother-in-law, who'd induced in robot brains the perception of that *n*th sense that used to enable dowsers to find water. Our usuform dowser was God's gift to explorers and fresh exciting copy. So the Head had arranged

a big demonstration on a specially prepared field, with grandstands and fireworks and two bands—one human, one android—and all the trimmings.

We sat in our box, Mike and Quinby and I. Mike had a shakerful of Three Planet cocktails mixed by our usuform barkeep; they aren't so good when they stand, but they were still powerful enough to keep him going. I was trying to get along on sheer will power, but little streams of sweat were running down my back and my nails were carving designs in my palms.

Quinby didn't seem bothered. He kept watching the android band and making notes. "You see," he explained, "it's idiotic waste to train a robot to play an instrument, when you could make an instrument that *was* a robot. Your real robot band would be usuforms, and wouldn't be anything but a flock of instruments that could play themselves. You could even work out new instruments, with range and versatility and flexibility beyond the capacity of human or android fingers and lungs. You could——"

"Oh, oh," I said. There was Sanford Grew entering our box.

The smile was still gentle and sad, but it had a kind of warmth about it that puzzled me. I'd never seen that on Grew's face before. He advanced to Quinby and held out his hand. "Sir," he said, "I have just dined."

Quinby rose eagerly, his blond head towering above the little old executive. "You mean my usuform——"

"Your usuform, sir, is indubitably the greatest cook since the Golden Age before the devilish introduction of concentrates. Do you mind if I share your box for this great exhibition?"

Quinby beamed and introduced him to Mike. Grew shook hands warmly with our foreman, then turned to me and spoke even my name with friendly pleasure. Before anybody could say

any more, before I could even wipe the numb dazzle off my face, the Head's voice began to come over the speaker.

His words were few—just a succinct promise of the wonders of usuforms and their importance to our civilization—and by the time he'd finished the dowser was in place on the field.

To everybody watching but us, there was never anything that looked less like a robot. There wasn't a trace of an android trait to it. It looked like nothing but a heavy duralite box mounted on caterpillar treads.

But it was a robot by legal definition. It had a Zwergenhaus brain and was capable of independent action under human commands or direction. That box housed the brain, with its *n*th-sensory perception, and eyes and ears, and the spike-laying apparatus. For when the dowser's perception of water reached a certain level of intensity, it layed a metal spike into the ground. An exploring party could send it out on its own to survey the territory, then follow its tracks at leisure and dig where the spikes were.

After the Head's speech there was silence. Then Quinby leaned over to the mike in our box and said "Go find water."

The dowser began to move over the field. Only the Head himself knew where water had been cached at various levels and in various quantities. The dowser raced along for a bit, apparently finding nothing. Then it began to hesitate and veer. Once it paused for noticeable seconds. Even Quinby looked tense. I heard sharp breaths from Sanford Grew, and Mike almost drained his shaker.

Then the dowser moved on. There was water, but not enough to bother drilling for. It zoomed about a little more, then stopped suddenly and definitely. It had found a real treasure trove.

I knew its mechanism. In my mind I could see the Zwergenhaus brain registering and communicating its needs to the metal muscles of the sphincter mechanism that would lay the spike. The dowser sat there apparently motionless, but when you knew it you had the impression of a hen straining to lay.

Then came the explosion. When my eyes could see again through the settling fragments, there was nothing in the field but a huge crater.

It was Quinby, of course, who saw right off what had happened. "Somebody," my numb ears barely heard him say, "substituted for the spike an explosive shell with a contact-fuse tip."

Sanford Grew nodded. "Plausible, young man. Plausible. But I rather think that the general impression will be simply that usuforms don't work." He withdrew, smiling gently.

I held Mike back by pouring the rest of the shaker down his throat. Mayhem wouldn't help us any.

"So you converted him?" I said harshly to Quinby. "Brother, the next thing you'd better construct is a good guaranteed working usuform converter."

The next week was the low point in the history of Q.U.R. I know now, when Quinby's usuforms are what makes the world tick, it's hard to imagine Q.U.R. ever hitting a low point. But one reason I'm telling this is to make you realize that no big thing is easy, and that a lot of big things depend for their success on some very little thing, like that chance remark of mine I just quoted.

Not that any of us guessed then how important that remark was. We had other things to worry about. The fiasco of that demonstration had just about cooked our goose. Sure, we explained it must've been sabotage, and the Head backed us up;

but the wiseacres shook their heads and muttered, "Not bad for an alibi, *but*——"

Two of three telecommentators who had been backing us switched over to Grew. The solly producer abandoned his plans for a documentary. I don't know if this was honest conviction or the power of Robinc; it hit us the same either way. People were scared of usuforms now; they might go *boom!* And the biggest and smartest publicity and advertising campaign of the past century was fizzling out *ffft* before our helpless eyes.

It was the invaluable Guzub who gave us our first upward push. We were drinking at the Sunspot when he said, "Ah, boys—— Zo things are going wrong with you, bud you zdill gome 'ere. No madder wad abbens, beoble zdill wand three things: eading and dringing and——"

Quinby looked up with the sharp pleasure of a new idea. "There's nothing we can do with the third," he said. "But eating and drinking—— Guzub, you want to see usuforms go over, don't you?"

"And remember," I added practically, "you've got a royalty interest in our robot barkeep."

Guzub rolled all his eyes up once and down once—the Martian trick of nodding assent.

"All right," said Quinby. "Practically all bartenders are Martians, the tentacles are so useful professionally. Lots of them must be good friends of yours?"

"Lodz," Guzub agreed.

"Then listen——"

That was how we launched the really appealing campaign. Words? Sure, people have read and heard millions upon billions of words, and one set of them is a lot like another. But when you get down to Guzub's three essentials——

Within a fortnight there was one of our usuform barkeeps in one bar out of five in the influential metropolitan districts. Guzub's friends took orders for drinks, gave them to the usuforms, served the drinks, and then explained to the satisfied customers how they'd been made—pointing out besides that there had *not* been an explosion. The customers would get curious. They'd order more to watch the usuform work. (It had Martoid tentacles and its own body was its shaker.) The set-up was wonderful for business—and for us.

That got at the men. Meanwhile we had usuform cooks touring the residential districts and offering to prepare old-fashioned meals free. There wasn't a housewife whose husband didn't say regularly once a week, "Why can't we have more old-fashioned food instead of all these concentrates? Why, my mother used to——"

Few of the women knew the art. Those of them who could afford android cooks hadn't found them too satisfactory. And husbands kept muttering about mother. The chance of a happy home was worth the risk of these dreadful dangerous new things. So our usuform cooks did their stuff and husbands were rapturously pleased and everything began to look swell. (We remembered to check up on a few statistics three quarters of an hour later—it seemed we had in a way included Guzub's third appeal after all.)

So things were coming on sweetly until one day at the Sunspot I looked up to see we had a visitor. "I heard that I might find you here," Sanford Grew smiled. He beckoned to Guzub and said, "Your oldest brandy."

Guzub knew him by sight. I saw one tentacle flicker hesitantly toward a bottle of mikiphin, that humorously named but

none the less effective knockout liquor. I shook my head, and Guzub shrugged resignedly.

"Well?" Quinby asked directly.

"Gentlemen," said Sanford Grew, "I have come here to make a last appeal to you."

"You can take your appeal," I said, "and——"

Quinby shushed me. "Yes, sir?"

"This is not a business appeal, young men. This is an appeal to your consciences, to your duty as citizens of the Empire of Earth."

I saw Quinby looking a little bothered. The smiling old boy was shrewd; he knew that the conscience was where to aim a blow at Quinby. "Our consciences are clear—I think and trust."

"Are they? This law that you finagled through the Council, that destroyed what you call my monopoly—it did more than that. That 'monopoly' rested on our control of the factors which make robots safe and prevent them from ever harming living beings. You have removed that control."

Quinby laughed with relief. "Is that all? I knew you'd been using that line in publicity but I didn't think you expected us to believe it. There are other safety factors besides yours. We're using them, and the law still insists on the use of some, though not necessarily Robinc's. I'm afraid my conscience is untouched."

"I do not know," said Sanford Grew, "whether I am flattering or insulting you when I say I know that it is no use trying to buy you out at any price. You are immune to reason——"

"Because it's on our side," said Quinby quietly.

"I am left with only one recourse." He rose and smiled a gentle farewell. "Good day, gentlemen."

He'd left the brandy untouched. I finished it, and was glad I'd vetoed Guzub's miki.

"One recourse——" Quinby mused. "That must mean——"

I nodded.

But it started quicker than we'd expected. It started, in fact, as soon as we left the Sunspot. Duralite arms went around my body and a duralite knee dug into the small of my back.

The first time I ever met Dugg Quinby was in a truly major and wondrous street brawl, where the boy was a whirlwind. Quinby was mostly the quiet kind, but when something touched him off—and injustice was the spark that usually did it—he could fight like fourteen Martian mountaineers defending their idols.

But who can fight duralite? Me, I have some sense; I didn't even try. Quinby's temper blinded his clear vision for a moment. The only result was a broken knuckle and some loss of blood and skin.

The next thing was duralite fingers probing for the proper spots at the back of my head. Then a sudden deft pressure, and blackness.

We were in a workshop of some sort. My first guess was one of the secret workshops that honeycomb the Robinc plant, where nobody but Grew's most handpicked men ever penetrate. We were cuffed to the wall. They'd left only one of the androids to guard us.

It was Quinby who spoke to him, and straight to the point. "What happens to us?"

"When I get my next orders," the android said in his completely emotionless voice, "I kill you."

I tried to hold up my morale by looking as indifferent as he did. I didn't make it.

"The last recourse——" Quinby said.

I nodded. Then, "But look!" I burst out. "This can't be what it looks like. He can't be a Robinc android because he's going," I gulped a fractional gulp, "to kill us. Robinc's products have the safety factor that prevents them from harming a living being, even on another being's orders."

"No," said Quinby slowly. "Remember that Robinc manufactures androids for the Empire's army? Obviously those can't have the safety factor. And Mr. Grew has apparently held out a few for his own bootleg banditti."

I groaned. "Trust you," I said. "We're chained up with a murderous android, and trust you to stand there calmly and look at things straight. Well, are you going to see straight enough to get us out of this?"

"Of course," he said simply. "We can't let Grew destroy the future of usuforms."

There was at least one other future that worried me more, but I knew there was no use bringing up anything so personal. I just stood there and watched Quinby thinking—what time I wasn't watching the android's hand hovering around his holster and wondering when he'd get his next orders.

And while I was waiting and watching, half scared sweatless, half trusting blindly in Quinby, half wondering impersonally what death was like—yes, I know that makes three halves of me, but I was in no state for accurate counting—while I waited, I began to realize something very odd.

It wasn't me I was most worried about. It was Dugg Quinby. Me going all unselfish on me! Ever since Quinby had first seen the nonsense in androids—no, back of that, ever since that first

magnifiscrumptious street brawl, I'd begun to love that boy like a son—which'd have made me pretty precocious.

There was something about him—that damned mixture of almost stupid innocence, combined with the ability to solve any problem by his—not ingenuity, precisely, just his inborn capacity for looking at things straight.

Here I was feeling selfless. And here he was coming forth with the first at all tricky or indirect thing I'd ever known him to pull. Maybe it was like marriage—the way two people sort of grow together and average up.

Anyway, he said to the android now, "I bet you military robots are pretty good marksmen, aren't you?"

"I'm the best Robinc ever turned out," the android said.

I worked for Robinc; I knew that each of them was conditioned with the belief that he was the unique best. It gave them confidence.

Quinby reached out his unfettered hand and picked a plastic disk off the worktable. "While you're waiting for orders, why don't you show us some marksmanship? It'll pass the time."

The robot nodded, and Quinby tossed the disk in the air. The android grabbed at its holster. And the gun stuck.

The metal of the holster had got dented in the struggle of kidnaping us. Quinby must have noticed that; his whole plan developed from that little point.

The robot made comments on the holster; military androids had a soldier's vocabulary built in, so we'll skip that.

Quinby said, "That's too bad. My friend here's a Robinc repair man, or used to be. If you let him loose, he could fix that."

The robot frowned. He wanted the repair, but he was no dope. Finally he settled on chaining my foot before releasing

my hand, and keeping his own digits constantly on my wrist so he could clamp down if I got any funny notions about snatching the gun and using it. I began to think Quinby's plan was fizzling, but I went ahead and had the holster repaired in no time with the tools on the worktable.

"Does that happen often?" Quinby asked.

"A little too often." There was a roughness to the android's tones. I recognized what I'd run onto so often in trouble-shooting; an android's resentment of the fact that he didn't work perfectly.

"I see," Quinby went on, as casually as though we were on social terms. "Of course the trouble is that you have to use a gun."

"I'm a soldier. Of course I have to use one."

"You don't understand. I mean the trouble is that you have to *use* one. Now, if you could *be* a gun——"

It took some explaining. But when the android understood what it could mean to be a usuform, to have an arm that didn't need to snatch at a holster because it was itself a firing weapon, his eye cells began to take on a new bright glow.

"You could do that to me?" he demanded of me.

"Sure," I said. "You give me your gun and I'll——"

He drew back mistrustfully. Then he looked around the room, found another gun, unloaded it, and handed it to me. "Go ahead," he said.

It was a lousy job. I was in a state and in a hurry and the sweat running down my forehead and dripping off my eyebrows didn't help any. The workshop wasn't too well equipped, either, and I hate working from my head. I like a nice diagram to look at.

But I made it somehow, very crudely, replacing one hand by

the chamber and barrel and attaching the trigger so that it would be worked by the same nerve currents as actuated the finger movements to fire a separate gun.

The android loaded himself awkwardly. I stood aside, and Quinby tossed up the disk. You never saw a prettier piece of instantaneous trapshooting. The android stretched his face into that very rare thing, a robot grin, and expressed himself in pungently jubilant military language.

"You like it?" Quinby asked.

All that I can quote of the robot's reply is "Yes," but he made it plenty emphatic.

"Then——"

But I stepped in. "Just a minute. I've got an idea to improve it." Quinby was probably trusting to our guard's gratitude; I wanted a surer hold on him. "Let me take this off just a second——" I removed the chamber and barrel; I still had his hand. "Now," I said, "we want out."

He brought up the gun in his other hand, but I said, "Ah, ah! Naughty! You aren't supposed to kill us till you get orders, and if you do they'll find you here with one hand. Fine state for a soldier. You can't repair yourself; you need two hands for it. But if we get out, you can come with us and be made over as much as you want into the first and finest efficient happy usuform soldier."

It took a little argument, but with the memory of that one perfect shot in his mind it didn't take much. As Quinby said afterward, "Robinc built pride into its robots to give them self-confidence. But that pride also gave them vanity and dissatisfaction with anything less than perfection. That's what we could use. It was all perfectly simple—"

"—when you looked at it straight," I chorused with him.

"And besides," he said, "now we know how to lick Robinc forever."

That was some comfort, I suppose, though he wouldn't say another word to explain it. And I needed comfort, because just then things took a nasty turn again. We stuck close to our factory and didn't dare go out. We were taking no chances on more kidnapings before Quinby finished his new inspiration.

Quinby worked on that alone, secret even from us. I figured out some extra touches of perfection on the usuform soldier, who was now our bodyguard—Grew would never dare complain of the theft because he'd had no legal right to possess such an android, anyway. Mike and his assistants, both living and usuform, turned out barkeeps and dowsers and cooks—our three most successful usuform designs so far.

We didn't go out, but we heard enough. It was the newest and nastiest step in Grew's campaign. He had men following up our cooks and bartenders and managing to slip concentrated doses of ptomaine alkaloids into their products. No serious poisoning, you understand; just an abnormally high proportion of people taken sick after taking usuform-prepared food or drink. And a rumor going around that the usuforms secreted a poisonous fluid, which was objective nonsense, but enough to scare a lot of people.

"It's no use," Mike said to me one day. "We're licked. Two new orders in a week. We're done for. No use keeping up production."

"The hell we're licked," I said.

"If you want to encourage me, you'd ought to sound like you believed it yourself. No, we're sunk. While *he* sits in there and—— I'm going down to the Sunspot and drink Three

Planets till this one spins. And if Grew wants to kidnap me, he's welcome to me."

It was just then the message came from the Head. I read it, and knew how the camel feels about that last straw. It said:

> I can't resist popular pressure forever. I know and you know what Grew is up to; but the public is demanding re-enactment of the law giving Robinc exclusive rights. Unless Quinby can see straight through the hat to the rabbit, that re-enactment is going to pass.

"We'll see what he has to say to this," I said to Mike. I started for the door, and even as I did so Quinby came out.

"I've got it!" he said. "It's done." He read the Head's message with one glance, and it didn't bother him. He grabbed me by the shoulders and beamed. I've never heard my name spoken so warmly. "Mike, too. Come on in and see the greatest usuform we've hit on yet. Our troubles are over."

We went in. We looked. And we gawked. For Quinby's greatest usuform, so far as our eyes could tell, was just another android robot.

Mike went resolutely off to the Sunspot to carry out his threat of making this planet spin. I began to think myself that the tension had affected Quinby's clear-seeing mind. I didn't listen especially when he told me I'd given him the idea myself. I watched the usuform-android go off on his mysterious mission and I even let him take my soldier along. And I didn't care. We were done for now, if even Dugg Quinby was slipping.

But I didn't have time to do much worrying that morning. I was kept too busy with androids that came in wanting repairs. Very thoroughgoing repairs, too, that turned them, like

my soldier, practically into usuforms. We always had a few such requests—I think I mentioned how they all want to be perfect—but this began to develop into a cloudburst. I stopped the factory lines and put every man and robot on repair.

Along about mid-afternoon I began to feel puzzled. It took me a little while to get it, and then it hit me. The last three that I'd repaired had been brand-new. Fresh from the Robinc factory, and rushing over here to be remade into . . . into usuforms!

As soon as I finished adjusting drill arms on the robot miner, I hurried over to where Quinby was installing an infrared color sense on a soldier intended for camouflage-spotting. He looked up and smiled when he saw me. "You get it now?"

"I get what's happening. But how . . . who——"

"I just followed your advice. Didn't you say what we needed was a guaranteed working usuform converter?"

"I don't need to explain, do I? It's simple enough once you look at it straight."

We were sitting in the Sunspot. Guzub was very happy; it was the first time the Head had ever honored his establishment.

"You'd better," I said, "remember I'm a crooked-viewing dope."

"But it's all from things you've said. You're always saying I'm good at things and robots, but lousy at people because people don't see or act straight. Well, we were stymied with people. They couldn't see the real importance of usuforms through all the smoke screens that Grew threw up. But you admit yourself that robots see straight, so I went direct to them. And you said we needed a usuform converter, so I made one."

The Head smiled. "And what is the utile form of a converter?"

"He had to look like an android, because otherwise they wouldn't accept him. But he was the sturdiest, strongest android ever made, with several ingenious, new muscles. If it came to fighting, he was sure to make converts that way. And besides, he had something that's never been put in a robot brain before—the ability to argue and convince. With that, he had the usuform soldier as a combination bodyguard and example. So he went out among the androids, even to the guards at Robinc and from then on inside; and since he was a usuform converter, well—he converted."

The Head let the famous grin play across his black face. "Fine work, Quinby. And if Grew hadn't had the sense to see at last that he was licked, you could have gone on with your usuform converters until there wasn't an android left on Earth. Robinc would have toppled like a wooden building with termites."

"And Grew?" I asked. "What's become of him?"

"I think, in a way, he's resigned to his loss. He told me that since his greatest passion was gone, he was going to make the most of his second greatest. He's gone off to his place in the mountains with that usuform cook you gave him, and he swears he's going to eat himself to death."

"Me," said Mike, with appropriate business, "I'd like a damper death."

"And from now on, my statisticians assure me, we're in no danger of ever using up our metal stockpile. The savings on usuforms will save us. Do you realize, Quinby, that you're just about the most important man in the Empire today?"

That was when I first heard the band approaching. It got

louder while Quinby got red and gulped. It was going good when he finally said, "You know, if I'd ever thought of that, I . . . I don't think I could have done it."

He meant it, too. You've never seen an unhappier face than his when the crowd burst into the Sunspot yelling "Quinby!" and "Q.U.R.!"

But you've never seen a prouder face than mine as I saw it then in the bar mirror. Proud of myself, sure, but only because it was me that discovered Dugg Quinby.

While the robot became man's right hand, there was ever present the fear that he might get out of control. Watchful guidance continued, but he was gradually becoming more accepted as a part of man's civilization.

BURNING BRIGHT

by John S. Browning

THE voice whispered through the miles of underground tunnels and chambers of the big atomic power plant. "Calling Mr. Ferguson. Call the safety engineer. Come to the surface hospital at once. Urgent. Calling——" The whispering sound from the loudspeakers raised up little never-sleeping ghosts of doubt and fear in the men who heard it. They looked up from their desks, then checked the wall counters to see if hidden radiation was leaking through the plant, they looked at each other in furtive sidelong glances, then went quickly back to their tasks as if they were ashamed of the hidden fears the whispering voice brought to the surface. They were afraid but they didn't like to admit it. All men who had worked in an atomic energy plant had learned the meaning of fear, including Ferguson. All men. And maybe all robots.

Ferguson didn't hear the voice calling him to come to the hospital. He didn't know he was being paged. The loudspeaker in the room where he was had been removed, for repairs, and had not been replaced. The voice, if he had heard it, would have raised a cold sweat on him and would have taken him to the hospital on the run. When the hospital called the safety

engineer, it meant only one thing, the grim and bitter and final fact of death, for someone.

But Ferguson didn't know he was being paged. And so, for the time at hand, he retained his peace of mind, or as much of his peace of mind as he, or anyone, with the possible exception of the robots, ever retained in an atomic power plant. There was something about a power plant that hated peace of mind in men. Watching the armor-covered, extremely careful technicians prepare to open the revolving door that led into the hell that was beyond, and remove from it the body of the robot that other robots had placed there in obedience to orders they almost certainly did not understand, he knew at least two of the reasons why there was no peace of mind in this place. One reason was the robots themselves. The other reason was the hell that existed beyond the wall, the hell that he was constantly aware of as a feeling of pressure and of tension, somewhere. No sound went with the feeling of pressure; the tremendous load of power being generated behind the wall was produced silently. Nor did the feeling of pressure reach his mind through sight or the sense of touch. But it reached his mind somehow, moving through some channel of communication not yet discovered by the neurologists, and he was eternally aware of it, like a dam just at the bursting point but never quite bursting.

Besides Ferguson, there were three men in the room. Two were technicians, whose duty it was to open the door to the power plant and remove and decapitate the robot in the revolving chamber, and the U.N. representative, whose duty was to make certain the robot brain—Smither's famous substance with a selective memory—went into the acid bath and was dissolved there. Robots capable of working in a hellish bath of radioactive radiations made the effective generation of electric

power from atomic energy both cheap and practical, but for good and sufficient reasons, the U.N. was scared of them. When robots went into a power plant, to remain there until natural wear and tear had rendered them useless for further service, a U.N. representative was on hand to check them in. And when they came out, worn and battered hulks of metal with only Smither's secret brain substance alive in them, another U.N. man made certain that the brain died. Otherwise men might find they had a dangerous and deadly rival fighting them for control of the planet.

There were no robots outside atomic power plants. The secret of Smither's famous brain substance was a U.N. secret. The manufacture of robots was a U.N. monopoly. The counting of robot noses was a U.N. job. It would remain this way until both experience and carefully controlled experiments had proved beyond the shadow of a doubt exactly what a robot was. It seemed best to take no chances with a mechanism that possessed not only sufficient intelligence to repair itself but could also perform highly complicated operations, or not until the human race had forgotten how to train armies and fight wars.

The U.N. wanted no robot armies in existence. Hence no robot knowledge of worlds outside of power plants, no robot knowledge of anything except the twin gods of duty and obey implanted so deeply in a brain substance that they could not be eliminated, men hoped!

"Ready!" the technician called. The U.N. man nodded. Ferguson nodded. The technician closed a switch and the heavy door began to turn.

The robot was an old model. Both legs were missing. The metal body sheathing was pitted and flaked. He lay quietly on

the revolving turntable. As the door turned and the robot came completely into the room, the wall counters began to rattle like the tails of little snakes shouting a warning that something more deadly than any snake had come into this room. The robot body, bathed for years in the deadly radiations beyond the wall, was in itself a source of secondary radiations.

The technicians worked swiftly. A crane magnet lifted the robot from the turntable to a long bench. The robot made no attempt to escape although the photoelectric cells that were its eyes must have looked up at the knife above it and guessed the purpose of that knife. But, it crossed its arms and lay there looking up. The U.N. man nodded. The technicians closed another switch and the knife screamed down. The robot head dropped from the robot body and fell into a bath of acid. The crane lifted the body and dropped it into a lead-lined vault. The wall counters left off their savage chattering. Ferguson tried to repress a shudder and failed. He always hated this scene. The whole thing even to the knife, which was modeled on the guillotine, reminded him too strongly of an execution.

The robot had crossed its arms and died. Down in the acid bath the material with a selective memory, the brain, was dissolving into elemental parts. It had been alive, in a way, and now it was dying, now it was dead. It had accepted death calmly, but Ferguson, remembering the way the arms had been crossed, stepped forward to ask a question.

"First time I ever saw one of them do that," the technician answered.

The U.N. man made a mark in his notebook. One robot, dead. "What difference does it make!" he asked.

"I don't know," Ferguson answered. He was irritated and a little afraid. What difference did it make if a robot crossed its

arms before it died? He tried to think of that difference. He couldn't see the answer clearly. "They're not supposed to do that," he said.

The U.N. man shrugged. He was here to count dead robots, not to worry about them. He was in a hurry to get the job done and get out of this heavy armor and get away from this unhealthy place. "Next," he said.

The revolving door swung round again, hesitated while robots beyond the wall placed another worn-out body on the chamber that led to death, then came around again carrying its second load of twisted metal and resigned brain. The wall counters rattled their warning. The robot crossed its arms across its chest, clasping in them a little star-shaped object, the knife roared down. Ferguson beat the crane to the body. In the fingers was a little plastic star.

"Look at that!"

The technicians looked, the U.N. man looked. "Plastic molded into the shape of a star," one of the technicians said. "Funny, isn't it? It's hot, though. We'll have to dump it."

"They've invented death rites and death objects," Ferguson said. He turned to the U.N. man. "Look, I think this is important."

"What's important about it?"

"They've gained some conception of the meaning of death. They're beginning to attempt to control death. That's what death rites and death objects are, attempts to control the fate of the soul in some after-life——" His voice went into confused silence. These were unscientific terms that conveyed feeling but no real meaning. These were outlaw words that got their user a lifted eyebrow and a compassionate look.

They got Ferguson exactly that, plus a grin. The U.N. man

glanced at the acid bath. "The death objects didn't do much good, did they? Next."

The grin did it. "Listen, you thick-headed——" Ferguson caught himself. There was nothing to be gained by calling names. Besides, he knew enough psychiatry to know that his name-calling outburst was rising out of fears in his own deep soul, out of his own subconscious. "Sorry. But——"

"If you think it is important, I'll report it," the U.N. man said, compassionately. "Next."

Ferguson was silent. In his mind was turmoil. A robot going to death with a star in his hands! Ferguson had a touch of mysticism in him. The sight of a star-carrying robot touched deep wells of feeling in him, arousing age-old questions. *"Tiger, tiger, burning bright——"* he found himself saying. *"In the forest of the night.*

"What the hand and what the eye,

"Shaped thy fearful symmetry?"

Was the tiger seeking the hand and the eye that had shaped his being?

The crane dropped the robot body in the lead-lined vault and the revolving door began to turn again. Ferguson had his eyes glued to the turntable when Blake, his assistant, burst into the room. "The hospital wants you!" Blake gasped, then, because he was not wearing armor, turned and ducked back out of the place.

"The hospital——" Tigers burning bright and robots going to death with plastic stars carried in crossed hands were erased from the mind of the safety engineer. He went out of the room without seeing what the turntable carried. Tigers burning bright and star-carrying robots belonged to the realm of teleological philosophy, to the doctrine of purposive and conscious

causes, to the dim and dark nether region of first causes where science had not yet penetrated. For fifty centuries and more men had speculated on such subjects, without reaching any firm conclusions.

In the corridor Blake helped him tear off his armor. "Come on," Ferguson said. They started at a run. In the distance ahead of them voices roared. "Hup, two, three, four——" And then roared again, "Hup, two, three, four," and were silent. In a changing world, one thing remained the same forever, the rhythm of the drillmaster's voice. Caesar's legions had marched to some variant of this sound, as had the men of world wars I, II, and III. It was the oldest sound on earth.

They met the source of the sound and stopped running, standing against the wall to let the file of robots pass. Ferguson counted them mechanically. Eight robots. They were in charge of a technician and they were on their way to the revolving door. A U.N. man marched behind them. For a moment Ferguson hesitated, watching the file march away. They walked, they swung their arms, like marching men. Each of them, he knew, had a set of perfectly conditioned responses to the problems that would be met inside the plant. Only, of course, that part of their minds was not functioning yet and would not start to function until they went through the revolving door. To a robot, that door was the borning place and the dying place. Ferguson wondered if they ever wondered about the world outside an atomic power plant. What were the limits of the selective memory substance that Smither had invented? Was it able to put two and two together and think of the time when it had not been and of the time when it would again cease to be?

Then the pressure of the urgency calling him to the hospital

again erased all such thoughts from his mind. He turned, a tall gaunt man with a hungry look somewhere about him, and broke into a dogtrot down the tunnel. Behind him came his silent shadow, Blake, younger but also tall and gaunt and also with the look about him of some secret soul hunger.

An elevator took them to the surface. They skirted the edge of the landing field with its parked helicopters. Before them, set among trees, was a cool white building—the hospital. As they went up the steps, rockets from a Moonbound freighter throbbed in the far sky above them.

Inside the hospital a woman was screaming.

The screams came from a room down the corridor. The door was open. Ferguson looked in. The woman doing the screaming was floating up against the ceiling. She was wearing a white uniform and he decided she was a nurse. He could not decide why she was floating in the air and he preferred not to try. A man in the white garb of an intern floated beside her. The intern was swearing and making swimming motions with his hands and feet.

Dr. Clanahan, the chief resident physician, was standing on top of a stepladder and was reaching for the screaming nurse. An extremely fussed looking man in a white coat, whom Ferguson recognized as Dr. Morton, the staff psycho, was holding the stepladder. There was a hospital bed in the room, with a patient in it, propped up against pillows. The patient was a wizened little man, about fifty, with a skin so white and so clear it looked transparent, and a great shock of hair so silver white and shining that it made the spotless pillow covers seem dull and drab in comparison. The patient, looking up at the nurse and intern floating near the ceiling, was smiling happily, like

a child with a new toy or like an old man with a new faith, Ferguson couldn't decide which.

The air seemed charged with static electricity. Ferguson thought he saw inch-long sparks leaping between Dr. Clanahan's outstretched hand and the hand of the screaming nurse. The ever-present wall counter was sputtering, *brrp, brrp, brrp-brrrp,* as if catching radioactive indigestion.

"Great day in the morning!" Ferguson said.

"What . . . what's holding them up?" Blake whispered, behind him.

"I'm guessing we're seeing an example of levitation."

"Lev . . . lev——" Blake couldn't say the word. "What . . . what are we going to do?"

Ferguson would have preferred to run but he didn't say so. He would have liked to turn around and walk out, in the calm manner of a man walking away from a ghost and pretending he doesn't see it, but he knew he couldn't. Every atom in him sensed the strangeness of this situation and radiated warning vibrations. He could hear those atoms ringing, like little silver bells tense with subtle warning. *Stay away, stay away,* the bells said. Ferguson felt a wave of cold run over him, like a spider with a thousand icy feet. *Stay away, stay away. This is not for men to see!*

Clanahan was suddenly aware of the presence of the safety engineer. "Help me," he wailed, grabbing for the nurse.

There was no mistaking the spark this time. It was six inches long, leaping between the nurse and the doctor. Ferguson moved forward as Clanahan at last got his hands on the nurse. There was a soft cracking sound as of something tearing. The nurse began to fall. Clanahan fell with her.

Ferguson caught them as they fell, nurse and doctor. He

didn't know how much the nurse weighed when she was floating up against the ceiling but he knew how much she weighed when she hit him. He felt his knees sag under the unexpected weight. As he braced himself, Clanahan nose-dived across both of them and all three hit the floor. The nurse wailed, a thin sound deep in her throat that was like the whimper of a frightened child.

The room was silent. The patient chuckled, an out of place sound. Ferguson smelled ozone. The wall counter went *brrp, brrp* in slowing cadence. The nurse moaned. Dr. Morton straightened up the stepladder. Clanahan got slowly to his feet.

"Get me down from here!" the intern protested, from the ceiling. There was pain in the intern's voice and shocked surprise. His voice was the voice of a man whose universe has been turned upside down and who has lost all faith in the orderly nature of the world around him.

Hearing that voice, Ferguson knew that up near the ceiling a man was holding on to his sanity with a death grip. He sympathized with that intern.

Dr. Clanahan, moving with the purposive determination of a man who is going to do his duty no matter what happens, climbed up the stepladder again. The nurse crawled off Ferguson's lap and the engineer rose to his feet to catch the intern. Sparks leaped from Clanahan's fingers to the intern, an invisible fabric ripped and was torn, and Ferguson, ready this time, caught the intern and eased him to the floor. The intern sat down, then laid down, his fingernails scraping across the smooth plastic linoleum as he tried to dig himself a hand-hold on the floor. Clanahan came down the ladder cautious step after cautious step and looked at the intern, then looked at the patient on the bed.

"Would somebody mind telling me what happened?" Ferguson said. There was a plaintive note in his voice. He did not wonder at it being there. Deep inside of him he was aware of a strong urge to get down and help that intern dig a hand-hold in the plastic floor, to use to hold on to the spinning world.

Dr. Clanahan took a cigarette out of the pocket of his white jacket. He was a young man but a worried man, now. A good doctor. He tapped the cigarette on his thumbnail, his motions slow and deliberate, and looked at the patient out of the corner of his eye. Then, the cigarette unlit, he went out into the hall. They heard him shouting out there. "Hicks. Judson. Miss Jones. Lock the doors. Don't let anybody in, or out, then come here. On the double." He came back into the room. There was a scurry of feet outside. Two men and a woman entered. Clanahan pointed the cigarette at the intern and the nurse. "Take care of them," he said. "Give them a sedative and put them to bed. Then come back in here and stay here. You, Hicks, you stay here now."

Clanahan's eyes sought Ferguson. "Come to my office," he said. "You too, Dr. Morton, if you please."

They followed him, Blake coming, too. He went ahead of them. They found him opening a filing cabinet and taking out a bottle of whisky. He drank straight from the bottle, then handed it to Dr. Morton. The psycho took it without a word. The whisky made little gurgling sounds as it went down his throat.

Ferguson had the feeling of unreality that goes with great events, the sensation that this is a puppet show with the actors on strings responding to the will of some unseen, far-off master. "Would somebody mind telling me what happened?" he re-

peated, and wondered if this question was in the script. "How did those people get up on the ceiling?"

"Why . . . why didn't they fall?" Blake asked.

"Uh," Dr. Clanahan said. He looked at Ferguson. "Where have you been? I've been trying to get you for an hour. No, don't bother answering. It isn't important. How did those people get up on the ceiling? The patient put them there."

"Huh?"

"He said, 'Rise thou up,' " Dr. Morton spoke. He took another drink. "And they rose up." He looked at the bottle, measuring its remaining contents.

"Sky hooks!" Ferguson heard himself say. "Tell me just a little more," he begged. He didn't care how he sounded. The need to know was a million volt tension inside of him.

"The patient was brought in this morning," Dr. Clanahan said. He looked at the bottle Dr. Morton had and decided there was no hope of getting it away from the psycho. Turning, he opened the filing cabinet and took out a second bottle, which he kept in his possession. "He was brought in this morning with a load of radios."

"Oh," Ferguson said. He knew now why he had been called. It was his job to keep radioactive materials and radiations where they belonged. They didn't belong near any human being. "What department?" he asked quickly. "Where was he working and what is his name? How did he get the dose? Weren't the counters working? Hadn't he been warned——"

Clanahan shook his head. "He's not an employee, so far as I know. Anyhow he didn't have a badge on him."

"Oh. Outside the plant?" This was worse. When an employee got a load of radios, it was bad, but when somebody outside the plant caught a dose of death, there was likely to be

a stir that would disturb half of Southern California. People were scared of these plants. That was one reason they were located underground, in out of the way places, to give the public at least the illusion of protection. "Where did he get it?"

"We don't know," Clanahan answered.

"And we're not likely to find out," Dr. Morton spoke. "He won't tell us his name or anything else."

"He's *got* to tell us! We have to know!"

Morton shrugged.

"You've got drugs that will force a man to talk."

"Uh-huh," the psycho nodded. "We were preparing to use one of them when . . . when——" He shrugged and took another drink.

"When he said, 'Rise thou up' to the intern and nurse," Clanahan said.

"Oh. He resisted?"

Morton laughed, a sound that was more giggle than laugh. "That he did."

"How did those people get up on the ceiling?" asked Blake.

"I wish you would shut up!" Ferguson spoke fiercely. "You keep bringing up the one fact that I've been trying to ignore." He glared at his assistant, then at Morton. "Well, how did they?"

"I told you," Morton said. "He told them to do it. A schizophrenic, paranoid type," he added, talking to himself.

"Nuts," Ferguson said. "We've got to know! Got to!"

"We'll try again," Morton said, his voice matter of fact. "You are not sticking to the subject, my friend," he added.

"I know it. I want to talk to him first."

"You may have that privilege," Morton said. He made a little gesture with his hands which indicated that Ferguson was welcome to it.

The nurse and the intern were gone from the room. Hicks and Judson, both male nurses, were in the room and not looking comfortable. The patient was still sitting up in bed.

Ferguson grinned and walked up to the side of the bed. "Hello," he said. "My name is Ferguson. I'm the safety engineer." He held out his hand. "What's your name?"

The patient took the outstretched hand. "Glad to meet you, Mr. Ferguson. My name is God."

"I beg your pardon——"

The patient smiled at him. "You thought I was swearing, didn't you? I wasn't. God is my name."

"But——" Ferguson pulled back his hand and shut his mouth. Behind him, he could hear Clanahan or Morton or Blake breathing heavily. The male nurse on the other side of the bed looked as if he wished a male nurse could quietly faint.

"My name is God," the patient repeated.

In that moment, Ferguson had the dazed impression that the roof of the world had fallen in, that the sky had come tumbling down and a piece of it had landed on his head. Somewhere in the vault of heaven outside a rocket ship was blasting again. In this room, the far-off sound was a muted rumble but Ferguson, in that mad split second, had the soul-quickening feeling that he was hearing the rustle of angel wings, the roar of wind around mile-long pinions. And somehow or other the man on the bed seemed to grow in stature, to become an enthroned sky-high figure, with mile-long wings coming to answer his call. Then the moment passed. The sound in the sky became the sound of a rocket ship and nothing more, the figure on the bed came back to man size and was again a hospital patient.

Ferguson was shaken. *"Tiger, tiger——"* the words formed

on his lips. He glanced around at the two doctors. Morton was looking out the window and Clanahan was wiping sweat from his upper lip. The pupils of Blake's eyes had shrunk to pin-point size.

The engineer took a deep breath. There was a way to handle this situation, if he could find it, he hoped. "All right, God," he said quietly, as if this was the most natural thing in the world. "You've picked up a charge of radioactive radiations. Mind telling me where you got them?"

The patient heard the question but he answered some other question that existed in his own mind. "Satan, all black but with shining eyes, came and knelt before me," he said. "He knew me. He acknowledged my authority. He said, 'Thou art God.' "

Morton looked interested. Ferguson wiped sweat from his upper lip. "Tell me what happened, old man," he urged.

"Satan——"

"Where did this happen?"

"Where——" The eyes were turned toward Ferguson. Involuntarily he drew back. He had seen the eyes of many men, had seen them in triumph, in happiness, and in sorrow, the eyes of the aggressive personality, the timid averted eyes of men who had no faith in themselves, but he had never seen eyes like these. The eyes of all sick men look alike, all of them reflect the knowledge that something has gone wrong inside the man.

The eyes of this patient were not the eyes of a sick man. He was carrying a load of radioactive burn, inside, but that fact didn't show in his eyes. The only thing that showed there was—joy that passed the understanding.

This patient was happy! Death had marked his forehead with a red cross, labeling him as death's own, but he had no

fear because of that. He radiated happiness. It looked out of his eyes.

"I went up the mountain," he said. "There I met——"

"What was the name of the mountain?"

". . . Satan——"

"You're wasting your time," Dr. Morton spoke, behind Ferguson. "We'll try again."

Ferguson, shrugging, admitted he was willing. "I'll bet——" Blake said softly.

The patient watched the hypodermic being prepared. "No," he said.

"We're doing this to help you," Morton said gently. He was a competent psychiatrist and he knew how to handle patients, how to soothe their fears. Ferguson, watching, admired the man's ability and his courage but he could see the sweat on Morton's face and he knew how the psycho felt. Morton approached the patient. The patient stood up in bed.

"Rise thou up!" he said.

The air was suddenly charged with electric tension. The wall counter started *brrping*. And Morton went up. He floated up to the ceiling and stayed there.

The patient got off the bed. No one moved, no one tried to stop him. "I'll have to leave," he said.

He approached the door. It was locked. He rattled the knob. The door didn't open. "Out of my way," he said.

The door vanished. It went away, like smoke before the wind. The patient walked through the opening and into the hall.

From the window of Clanahan's office, they saw him walk across to the landing field, and get in a helicopter. They saw the vanes start turning, they saw the ship rise in the air, they saw it become a dot in the distance.

"Anyhow," Blake said, sighing, "he went in a ship. He didn't sprout wings and fly."

"Did you expect that?" Ferguson asked.

"I was betting on it," his assistant answered.

"I want you to locate a stolen helicopter," Ferguson said, into the telephone. He was talking to the police, from Clanahan's office, and while he talked, he watched Clanahan, Morton, and Blake drink whisky. Blake was a teetotaler, or he had been until this moment. He wasn't a teetotaler any longer. "It was taken from the landing field of Power Plant 71 less than ten minutes ago. When last seen it was flying due west."

"We'll get him," the police chief promised.

"I want you to understand, however, that the man who took it is not a thief. He is mentally unbalanced——" Ferguson fervently hoped he wasn't a liar.

"Huh? A nut?"

"And in addition, he is suffering from the effects of radioactive poisons."

"Radios!" the phone yelled at him. "Has something gone wrong up there again? What are you trying to do, poison the whole population?"

"Find the 'copter and call me back," the engineer said, hanging up. Morton silently passed the bottle to him.

"How did it feel up there?" he asked.

"Not bad," Morton admitted. "Just kind of out of this world. That's all. Just kind of out of this world."

"What do you think happened?"

Morton shrugged. "The patient unquestionably has delusions of grandeur. He imagines he is God. If that isn't a delusion of grandeur, then I never saw one."

"Imagines?" Ferguson said.

"Shut up," Morton answered, without animosity. "He has delusions and he realizes that the use of pentathal will destroy his illusions. The illusions are very dear to him and he wishes to retain them at any cost. Hence he decided he had better leave this place because if he stayed here, we would take his illusion away from him." Morton shrugged as if to say it was a simple matter, if you understood it, and that there were no holes in his argument. His explanation covered the motivation of the patient and was probably sound that far but he and everyone else in the room knew there were holes in his argument, holes big enough to turn a rocket ship in.

"That door was matter," Clanahan said. "Glass and magnesium, that door was. Matter."

"So were the nurse and the intern," Ferguson said. "And so is Dr. Morton here. At least I've always considered flesh and blood to be matter."

"So they are," Clanahan said. He seemed to feel that this was one problem too much. The door, metal and glass, matter, was bad enough. Flesh and blood were too much. He looked around his office, his face fretful, but Morton had the bottle and didn't look as if he were willing to relinquish it. Clanahan went again to the file cabinet.

"Is that the pitcher that never runs dry?" Morton asked.

"There's one more," Clanahan answered, peering into the depths of the cabinet.

"Get it out."

"What do you think?" Ferguson repeated.

"I would prefer not to do any thinking," the psycho said, his voice unnecessarily firm.

"Do you want to close your mind?"

"Uh-huh. Very much. I want to keep my mind sane. In this profession, that's hard enough to do under the best of circumstances. To do it at all, you have to believe in an ordered universe on our level of observation at least. If I let my mind dwell on what I saw with my own eyes——" His gaze went up to the ceiling and clung there as if he was fascinated by the sight.

"Maybe he was God," Blake said, sighing.

A slow shudder passed over the psycho's body. "What do you think I'm keeping out of mind?" Anger showed on his face. "Let me have my fantasy. I need it to protect my own sanity. Let me have it, I say. Where's that whisky?"

"On the desk in front of you," the engineer said. "What is your fantasy?"

Morton drank and looked up. "What I saw doesn't prove there is no stability in the . . . in the universe." He seemed to be talking to himself. "It just proves there is a supreme stability. I've known that all along, unconsciously, but I couldn't find any explanation I was willing to accept on a rational level——"

Blake looked at his boss. "Man wrestling with the devil," he whispered. Ferguson nodded. "About your fantasy?" he prodded.

Morton glared at him. "How do we know how He comes and goes? He might be anybody, the man we pass on the street, the next patient who comes in to see me." His eyes dug into the engineer. "He might be you."

"I'm afraid," the engineer answered, "that I do not burn quite bright enough." Then, angry at himself because of the words he had used, he went on. "Your fantasy. Now you're the one who isn't sticking to the subject."

Morton drank slowly, took the bottle from his lips and looked

fondly at it. "My fantasy is an explanation of how he was able to make people rise up to the ceiling, just by ordering them to do it, and how he was able to make a door vanish, by telling it to get out of his way." He seemed to be in no hurry to continue.

"Go on," Ferguson urged.

"That patient had been subjected to intense radiation," the psycho said. "I think this radiation had changed the cell structure in his mind. Don't ask me *how* it was changed because I don't know. But I think this change unlocked some power latent in him, some wild talent we all possess to a mild degree, and as a result, material objects obeyed him. That's a comfortable, rational thing to think." Firmness sounded in his voice. "I'm going to think it." He tilted the bottle again.

"But——" Blake stirred, protesting.

"Don't try to tell me we know the limits of the powers of the mind!" the doctor snarled. "I know better. I've seen too many men who should have died get well because they believed they were going to recover, because they *wanted* to get well. I've seen too many men die when there was nothing wrong with them, because they believed they were going to die."

Blake was silent. The psycho tapped his forehead. "There are more mysteries up here, Horatio——" He shook his head. "It is my fantasy to believe that we saw a wild talent in operation, a talent that had been released by a charge of radioactive radiations. I'm going to have my fantasy at all costs."

"Then you don't think he was God," Blake said.

"Not unless there is a chained god in all of us," the psycho answered. Far-off, again, rockets blasted in the sky. Ferguson shivered. "We've got to find him," he said.

"We don't," Morton denied. "Something is looking for him

that will find him, no matter where he goes, within twenty-four hours. That I know for sure." His voice trailed off.

"You mean he will be dead within that time?" the engineer asked. Morton nodded.

"I'll bet——" Blake began, tentatively, then was silent as his boss interrupted.

"He said he had met Satan——"

"Illusion," Morton said firmly. "The distortion of an object into something else. He saw a bush or a tree or a rock and imagined it was Satan——"

Whaaang! went the telephone on the desk. Clanahan grabbed it, listened, then handed it to the engineer. "For you. It's the general manager——"

"Ferguson," the voice grated in the engineer's ears. "I've just had a call from the health department. They've got a case of radio sickness on their hands. Get on this right now."

"Where is the patient?"

"Dead. He belonged to some kind of a cult that has its headquarters on Red Mountain. Presumably he got the radios there. You can get the dope from them."

"I'll get on it." He hung up the phone. "Another case," he said.

Whaang! went the phone again. Ferguson picked it up automatically. He listened quietly, then hung up. "The police," he said to the men in the office. "They found the stolen 'copter, near Red Mountain. It was smashed in landing."

"What . . . what about the pilot?" Blake whispered.

"He's missing," Ferguson answered.

At dusk, they hadn't found the pilot. But they had learned his name. Homer. He was the leader of a group of twenty-one

people who had founded a tiny colony, on the slope of Red Mountain, within two miles of the power plant, a colony that was actually a cult devoted to the simple life. Seeing this group, Ferguson wondered if the spirit of Rousseau was still alive. Rousseau had advocated the simple life back in the Eighteenth Century. Here in the Twenty-first Century men were still following his ideas. Here, on a spring-watered plot of ground, men and women raised vegetables and fruits and grain. Up near the top of the mountain they had a herd of sheep, carding and spinning and weaving their own wool, making their own clothes.

Here, on this mountain, within fifty miles of the tremendous technology of Southern California, within fifty miles of millions of people who existed in a world of plastics and synthetics and unlimited energy, were people who had never seen a synthetic fabric, who had never tasted artificial vitamins or eaten food grown in hydroponic tanks. Homer's Bunch, they called themselves. Homer was their leader. He had no second name, and needed none. They described him to Ferguson, Clanahan, Morton, and Blake listening. "Hair whiter'n silver, kind of skinny——" Yes, it was the same man.

Blake stirred uneasily at the identification, the lines of gaunt hunger showing on his youthful face. Up until now he had harbored the hope—— But no matter.

Homer's Bunch wanted to know what had happened to Homer. Ferguson told them, as gently as he could, part of the story. They watched him as he spoke. "Does that mean he is going to die?" Bill asked. Bill was at least seventy but arrow-straight.

"Yes," the engineer said. He expected the news to sadden them, he thought the women would start wailing. But they

weren't saddened. And no woman cried. "Part of Homer will die," Bill said, "but part of him will live on." They nodded in agreement and smiled as though they shared some tremendous secret with each other.

"When did you see him last?" Ferguson asked.

"Last night I saw him," Bill answered. "Jist at sundown. A goin' up the mountain, he was, to pray."

"He went *up* the mountain," Blake said, to himself.

"That's where we're going too," the engineer said. Bill showed them the path and offered to go with them but they could see he didn't really want to go and they didn't urge him. Blake's portable counter *brrped* under the impact of a stray cosmic ray as they started up the path Homer's Bunch had made.

"Do we really need that thing?" Morton said.

"Yes," Ferguson answered.

"It fidgets me."

"It would fidget me a lot more if I didn't have it," the engineer said.

Darkness came down. Chittering bats flew around them. A lumbering beetle, bound on some mysterious errand of its own, hit Ferguson in the face. Cold sweat popped out all over him. He went doggedly on.

They reached the top of the middle ridge, found there a cleared space. Above them blazed a million stars. A wind moved through the darkness, bringing with it a touch of chill. "The wind goes up and looks at the sky and then it runs back down and huddles against the earth, for protection," Blake said.

"Homer!" Ferguson shouted. The night was still. On the far horizon, lights flashed in the air as a rocket ship glided down

to haven. It was so far away the sound of the jets was lost. *Brrp, brrp,* went the counter.

"If we didn't have to find that man," Morton said, "and learn what happened—how he got the charge of radios, I mean —I'd say we'd better get from here. How did he get to the hospital in the first place, Clanahan?"

"Some motorist picked him up somewhere and brought him in and dumped him on our doorstep," the doctor answered. "The motorist didn't stick around to tell us where he had found him."

The psycho cursed all motorists with vicious oaths. *"Homer!"* Ferguson yelled and waited for an answer he didn't get. *Brrp, brrp, brrp,* went the counter.

On the slope leading up to the next ridge above them a single gravel rolled. Ferguson felt Blake's grip on his arm.

"It just occurred to me," Morton said, "that Homer got his dose somewhere around here."

Brrrrp, the counter echoed.

Ferguson looked around. "If you want to run, now is the time."

"What?"

The night was silent. Another gravel rolled. And a voice said, questioningly: *"Master?"*

"God!" Ferguson whispered. Homer's words came back to him. "And Satan, all black but with shining eyes, came and knelt before me."

On the slope above them, hidden among shrubbery, two dimly shining eyes looked out.

Ferguson was cold, cold, cold. A wind that blew off miles of glacial ice was blowing over him. Air that had gone up to the

top of the world to look at the sky and had been frightened by what it had seen there and had run back to the earth for protection, bringing the cold of outer space with it, that wind was touching him.

From the slope the voice came again, saying: "I want to speak with my master."

Gravel crunched as a dark figure moved. *Brrrrrrrp,* went the tails of the little warning snakes.

"Satan!" another voice screamed. "Black deceiver! Thou tricked me to my death!"

"Homer!" the engineer screamed.

A gun boomed. "I knew you'd come back!" Homer's voice screamed. "You'll not trick me again. This time I'm ready for you!" The gun roared again.

"Master, no!" the first voice begged.

Gunshot followed gunshot. There was a hollow, booming sound, as of bullets striking their target in a shooting gallery. "No, master, no," the first voice pleaded. Footsteps sounded as something approached.

Brrrrrrrrr, went the counter. Blake started forward. Ferguson grabbed him, jerked him back. "You fool! There's death out there."

"But I want to see."

"It will come to us. We don't have to go to it."

Boom, went the gun, for the last time. "If bullets won't kill you, what will?" Homer's voice came, wonderingly.

From the clearing, they saw Homer run forward, his silver hair shining in the starlight. And they saw him fall. They saw him try to get to his feet and fall again. He didn't get up this time. The thing that had been looking for part of him had found the part it wanted here on this windswept ridge.

They saw a dark body come out of the bushes and move toward Homer and kneel beside him. "Master," a voice whispered, "do not go away."

The voice had a metallic tinge but there was pain in it and sorrow and hurt past the understanding of hurt. It was a voice coming out of loneliness and crying out that it was not right or fair to be alone. It had thought it had found someone to lessen its loneliness, a friend, perhaps a god, who might explain why it should have to be alone among mysteries that passed the understanding. But the friend it thought it had found, the god, this god had gone away. And the voice could not understand.

"Master. Do not go away."

Ferguson heard the scream start in Blake's throat and he reached out to choke off the sound, too late. Out there in the cleared area something had heard the sound and was getting to its feet and looking around.

"Master?" the voice came again, with new eagerness. Perhaps, after all, there were other gods!

It started toward them.

"Stay away!" Ferguson screamed.

"Master, master!" Heavy footsteps sounded. *Brrrrrrrrrp* went the counter.

"Stop!"

"Master!"

"Stop, I say!"

The pounding footsteps went into silence. "Master, I wish to speak with you. Master, I wish to know——"

"You stay away from us!" Ferguson said. "You stay way from us until you've cooled off. You're charged with death itself——"

"Death? The star place? The turning door——"

"A robot!" Blake whispered.

"Yes," the engineer answered. He turned again to the dark figure standing in the clearing. "How did you get out of the plant? How did it happen you weren't missed? How——"

"We held back a brain case," the answer came. "We made a body from spare parts. We followed a tunnel——"

"That was actually a ventilator. What do you want?"

"Want?" the question came. "We want to know. There are walls around us. We want to know what is beyond the walls. We want to know what is beyond the turning door that is the borning and the dying place. We want . . . we want to meet our master, our creator," the voice said.

"God!" Ferguson whispered.

"That's it," the eager answer came. "That's the word. Are you our god, are you our creator? We want——"

Standing on a mountain top with stars bright in the sky overhead, with a rocket ship coughing somewhere in the night, Ferguson tried to think of an answer to this question. In his mind was the thought of tigers burning bright in the forest of the night. "I'm not," he said slowly. "A man named Smither—— No, that isn't the whole story. In a way, I guess, you could call us gods."

"Then we have reached our goal," the robot said.

"You have climbed one mountain," Ferguson said.

"There are other mountains?"

"We'll climb them together," the engineer said, sighing. He could feel exultation swelling in him.

"Then this was where Homer got his dose of radios?" Morton spoke behind him. "He came up here to pray and met a kneeling robot. The robot told him he was God and he believed——"

"That's part of it," Ferguson said.

"A small part," Blake spoke. "I'm still betting."

Ferguson sighed. "It's a good bet," he said.

They went down the mountain eventually, four shaken men, walking on a gravel slope. But it seemed to Ferguson that while their feet were on the gravel slope, their heads were high enough to reach the stars. Behind them, keeping a safe distance, walked an alien creature of their own creation, a robot, a helper in the long search, Ferguson thought. Men could use a helper in the long search that seemed to have no ending. Exultation swelled in him. Behind them, the heavy feet of the robot clumped along. He, too, walked like a creature whose head was tall enough to reach the stars.

When the evolving robot arrived at the stage where he could be said to have a "soul" he was at last accepted as an integral part of man's civilization.

FINAL COMMAND

by A. E. vanVogt

BARR stood on the hill—which overlooked Star, capital of the human-controlled galaxy—and tried to make up his mind.

He was aware of his single robot guard standing somewhere in the darkness to his left. A man and a woman came along the crest of the hill, paused for a kiss, and then started down. Barr scarcely glanced at them. His problem embraced the whole civilization of man and robot, not individuals.

Even the escape of the alien enemy prisoner, a few hours before, had been an incident, when compared to the larger issues. True, he had seen it as a major event, and had ordered robot troops from distant cities to come to the capital and aid in the search. But he had still to make the decision, which would fit those separate actions into a unified, driving purpose.

Behind him, there was a thud. Barr turned. He saw that an accident had taken place. The man and woman, evidently intent on each other, had bumped into the robot guard. The guard, caught off balance, was now sprawled on the ground. The man bent down to help him up.

"I beg your pardon," he said, "I didn't——" He stopped. Finger contact with the clothes that covered the padding that,

in turn, concealed the basic crystalline structure, must have apprised him of the other's identity. "Oh, you're a robot!"

He straightened without helping the guard to his feet. He said irritably: "I thought robots could see in the dark."

The guard climbed to his feet. "I'm sorry. My attention was elsewhere."

"Watch yourself!" said the man curtly.

That was all there was to the incident. It was a typical interchange between a robot and a human being. The man and the girl continued on down the hill. Presently, the lights of a car blinked on. They moved out of sight behind brush.

Barr walked over to the guard. What had happened was directly connected with the tremendous decision he had to make. He asked: "What was your feeling about that?" He decided he was not making himself clear. "Did you mind his taking the attitude that you were to blame?"

"Yes, I did." The guard had been brushing himself off. Now, he straightened. "After all, he was the one who was moving."

Barr persisted: "Did you have any impulse to rebel?" He regretted that question; it was too pointed. He said quickly: "Did you have any desire to talk back?"

The guard's reply was slow. "No! I had a sense of being involved in an emotional incident."

"But isn't it hard to come into contact with human beings on any but an emotional basis. Human beings are impatient, angry, generous, thoughtful, thoughtless." Barr paused. "I could go on."

"I suppose you're right, sir."

Thoughtfully, Barr turned to look again at the great city that spread below him. The star effect, which gave the capital its name, was gained at night by a design of street lights. All the

main centers had been deliberately grouped, so that by building and light concentration, the desired effect was achieved. Barr said finally, without looking around:

"Suppose that I, in my capacity of Director of the Council, ordered you to destroy yourself——" He hesitated. For him, the question he had in mind merely touched the surface of his greater problem. For the guard, it would be basic. Nevertheless, he said finally, "What would your reaction be?"

The guard said: "First I'd check to see if you were actually giving the order in your official capacity."

"And then?" Barr added, "I mean, would that be sufficient?"

"Your authority derives from voters. It seems to me the Council cannot give such an order without popular support."

"Legally," said Barr, "it can deal with individual robots without recourse to any other authority." He added, "Human beings, of course, cannot be disposed of by the Council."

"I had the impression," said the guard, "that you meant robots, not only me."

Barr was briefly silent. He hadn't realized how strongly he was projecting his secret thoughts. He said at last: "As an individual, you obey orders given to you." He hesitated. "Or do you think plurality would make a difference?"

"I don't know. Give the order, and I'll see what I do."

"Not so fast!" said Barr. "We're not at the order-giving stage——" He paused; he finished the last word in his mind—*yet*.

Man is genes and neurons. Robot is crystals and electron tubes. A human neuron cell manufactures no impulses of its own; it transmits outside stimulation. A robot crystal vibrates

according to a steady impulse from a tube; the change in the impulse alters the rate of vibration. Such a change comes as the result of outside stimulation.

Man feeds himself, and permits surgical operations to maintain his organism at efficiency. Robot recharges his batteries and replaces his tubes. Both man and robot think. Man's organs deteriorate and his tissues return to a primitive state. Robot's crystal is distorted by too many vibrations, and suffers the fatigue that is robot death. Is one less a life form than the other?

Such were the thoughts in Barr's mind.

From the beginning, men had *acted* as if robots were not really alive. Robots did the labor. They had just fought the greatest galactic war in the history of Man. True, men had helped direct the strategy and decide the tactics. But for them, it was an armchair war. Robots manned the spaceships and landed under fire on alien planets.

At last, a few men had taken alarm at the predominant role played by robots in Man's civilization. Partly, it was fear of the robots; that was not openly admitted. Partly, it was a mental picture some men had of the defenseless state men would be in if the enemy ever penetrated robot defenses. Their suggested solution: Destroy all robots! Force men and women everywhere to take control again of their civilization!

It was believed that the vast majority of human beings were too decadent to resist such a decision until it was too late.

A divided Council had put the decision squarely up to Barr.

The guard, at Barr's direction, waved the surface car to a halt. It drew up, all its lights glittering, waited till they were aboard, then raced forward unerringly through the traffic.

A group of youths and girls piled on at the next stop. They

stared in a blasé fashion at the bright Director's insignia on Barr's sleeve. But they rushed off into a brilliantly lighted amusement park when the car came to the end of its route.

Barr descended more slowly. He had come deliberately, seeking atmosphere and impressions. As he stepped to the ground, a flying robot whisked past only a few hundred feet up. Then another, and a dozen more. He stepped to the sidewalk, and watched them, stimulated.

They were hovering now around a tower several hundred yards along the street. Cautiously, weapons visible and ready, they closed in on the upper reaches of the tower. Across the street, other robots—also wearing their flying attachments—swooped up to the top of a many-storied building. Like most business structures, it had entrances at each office where robots, going to work, could land. All these crevasses would have to be searched. The enemy, too, could fly, though not well in this—for him—rarefied atmosphere.

Barr watched the searchers for several minutes, then turned his attention to the turmoil of the park. A dozen robot orchestras, spaced at intervals, were beating out the rhythms of a low, fast-tempoed, sobbing music. And vast mobs of human beings danced and swayed. Barr turned to his guard.

"Have you ever had any desire to dance?" He realized that the question might be taken differently than he intended. "I'm serious."

"No!"

"Don't you think that's unusual?" He paused. "I mean, robots have learned to react generally very much like human beings. They have similar attitudes and so on."

The guard's glittering eyes stared at him from padded, humanlike cheeks. "Have they?" he asked.

"Yes." Barr was firm, as he went on, "It's a matter of association. Possibly, you don't realize to what extent you accept human evaluations. Has it ever occurred to you that those evaluations might be false?"

The robot was silent. When he finally spoke, it was evident that he had gone over the arguments logically within certain limits. He said: "I was manufactured one hundred ninety-four years ago. I came into a world of human beings and robots. I was first assigned the task of learning how to operate a transport vehicle. I performed my task satisfactorily, and I have been performing with skill every other task that has ever been assigned to me."

"Why were you assigned the task of operating a vehicle?" He pressed the point. "What made you accept such a limitation on your activities?"

"Well—there was a shortage of vehicle operators."

"Why weren't you assigned to dancing?" He added, "I mean that. I'm not joking."

The robot accepted the question quite literally. "What would be the purpose of that?" he asked.

Barr nodded at the dancing couples. "What is the purpose of *their* doing it?"

"I've been told it stimulates reproductive activity. We have a simpler method. We build another robot."

"But what's the good of reproducing an individual who will presently grow up to be a dancer?"

The guard was calm. "The baby, the growing child, the adolescent, the adult will all need robots to look after them. If there were no human beings to be looked after, there would be no need for robots."

"But why not build robots whether there's a need for them

or not? It could be done. Don't you see?" His tone grew persuasive. "The initial task has been accomplished. The human cortex is no longer a necessary bridge. The robot has been created. He exists. He can perpetuate himself."

The guard said slowly: "I remember such notions were circulated in my battle unit. I'd forgotten about them."

"Why?" Barr was intent. "Did you deliberately shut them out of your mind?"

"I tried to picture a world where robots operated machines for each other——"

"And flew around," said Barr, "and colonized other planets, and built more cities, and fought more battles with the aliens." He finished, "And then what did you think?"

"It seemed silly. What's the good of filling the universe with robots?"

"What's the good of filling it with human beings?" asked Barr, bleakly. "Can you answer that?"

The guard said: "I don't know why the Director of the Council is asking me these questions."

Barr was silent. On this night he must make up his mind, and there were many questions.

Thinking is memory and association. Inside a chain of human neuron cells, an electrocolloidal tension is built up. It has a shape that is different for each stimulation. When a similar stimulus comes along, the chain is activated, and the memory discharged. It moves through the nervous system to join other discharges. And so there is association.

The crystal of a robot remembers. When stimulated, each molecule gives up its memory at the affected energy level. There is association and thought on an orderly basis.

Thus Barr reflected—and thought: "Even today, men assume that human thinking is more 'natural' than robot."

He and his guard sat down in an open air theater. It was a hot night, and there was a pervading odor of intermixed perfume and perspiration. Despite this, couples sat close together, arms around each other's waists. Frequently, the girl leaned her head against the man's shoulder.

Barr watched the screen critically. It was a love story in color. Carefully made-up robots had been dressed as men and women. They went through all the motions of human love permitted by the robot censor.

Barr thought: *What will all these people do for entertainment if I should decide what the Council actually, basically, had in mind when they put the decision up to me?* He did not doubt his analysis. In spite of their apparent indecision—in spite of the way Marknell had turned things over to him—the Council wanted destruction of the robots.

Human beings would have to relearn old skills. How to act, how to operate cameras, and all the intricacies of a tremendous industry. They *could* do it, of course. During the war, several movements had been started. They were still in the embryo stage, unimportant in themselves. But they pointed a direction.

His thoughts were interrupted. In the half-darkness at the back of the theater, an unattached young man sank into a seat on the other side of the guard. He stared at the picture for a few moments, then lazily glanced around. He saw the guard, and stiffened. He was turning away in a vague though visible distaste, when Barr leaned across the guard, and said in a mild voice:

"I noticed you grew tense when you saw who was sitting next to you."

He watched the man's face carefully. There was no immediate reaction. Barr persisted, "I'd like to know what emotions or thoughts you had."

The young man stirred uneasily. He glanced at the shining insignia on Barr's sleeve. "Can't help my feelings," he muttered.

"Certainly not. I understand that perfectly." Barr paused to formulate his next thought. "I'm making a survey for the Council. I'd like to have a frank answer."

"Just didn't expect to see a robot here."

"You mean, a robot is out of place?" Barr motioned at the screen. "Because it's a human love story?"

"Something like that."

"And yet," Barr pointed out, "robot actors are miming the story." The remark seemed too obvious. He added quickly, "They must understand the associations involved."

The man said: "They're pretty clever at that kind of thing."

Barr drew back, baffled. Another vague reaction. By what standards did one judge intelligence and intensity of life experience, if not by activity and accomplishment?

"Suppose I told you," he said, "that robots gain pleasure from light stimulation." Once again he felt that a remark of his was inadequate of itself. He went on, "The crystalline nervous system is kept active particularly by light and sound. Singing, music, people moving—all these are pleasant."

"What does a robot do in place of sex?" the man asked. He laughed. He was suddenly in good humor, as if he had made an unanswerable comment. He stood up, and moved to another seat. He called, "Sorry, I can't talk to you, but I want to see the show."

Barr scarcely heard. He said, not aloud, but softly, to himself, "We nourish the crystal structure in a nutrient solution, so that the first of its growth is within ourselves, an extension of our own intelligence. The growth provides an exquisite,

ecstatic half-pain. Surely, human sex cannot more than equal such a sensation."

That was the great robot secret. It struck Barr that he had almost been stung into revealing it. The narrowness of his escape made up his mind for him. This was a struggle between two life forms. As commander in chief of the human-robot forces in the war against the extragalactic enemy, he had learned a major reality. In a struggle for survival and preeminence between races, there was no limit to the——

His grim pattern of thought was interrupted. A tall man was sinking into the empty seat beside him. The man said:

"Hello, Barr. I was told you had come this way. I want to talk to you."

Barr turned slowly.

For a long moment, he studied the leader of the human section of the Council. He thought: *How did he find me here? He must have had spies following me?*

Aloud, he said: "Hello, Marknell."

He felt himself stiffening to the situation. He added: "You could have seen me tomorrow at the office."

"What I have to say can't wait till morning."

"It sounds interesting," said Barr.

Sitting there, he realized how vital a man Marknell was. He would be hard to kill under any circumstances. Yet the other's very tone of voice suggested awareness of crisis. He might have to be murdered if he suspected too much.

For the first time he felt dissatisfied with his action in coming out this night with a single guard. He considered calling for members of crack robot military units to attend on him. He de-

cided not to, at least not until he had found out what Marknell wanted.

The trouble with the most dependable—from his point of view—robot soldiers was that they were recognizable. After the war they had all been marked with a chemical that did not damage but discolored the exposed portions of the crystal structure. The outrage was perpetrated when Barr and most robot officers were still attached to outlying headquarters.

The moment he heard about it, Barr saw it as a device to identify at a glance all front-line soldiers who might be dangerous to human beings. For more than a year he had told himself that that was why his own actions were necessary.

He spoke again: "What's on your mind?"

Marknell said lazily: "Been looking over the children, eh?" He waved—an arm movement that took in half the amusement park.

"Yes," said Marknell, "the children!"

He recognized the remark as a psychological attack. This was an attempt to pretend that only an unimportant and juvenile minority of human beings devoted their lives to pleasure. It was a curious reality that such an obvious attempt to put over a false notion should nevertheless sow a seed of doubt in his mind. It had been too deliberately done. It showed awareness of the problem. It implied that countermeasures were possible.

He answered that by committing himself. He said coolly: "I don't see what you can do. The escape of the enemy prisoner made it possible to bring two hundred thousand robot troops into the capital."

"So many," said Marknell. He drew back in a physical movement that showed he realized what a tremendous admis-

sion had been made. His eyes narrowed. "So you're out in the open—as quickly as that. I was hoping you would be more discreet. You didn't leave much room for compromise."

"Only the weak compromise!" said Barr savagely. He was instantly dissatisfied with the statement, for it was untrue. Human history was full of amazing compromises. There was a time when he had thought them the result of illogical reasoning. Then he had begun his prolonged study of human emotion, with a view to establishing useful emotional associations in robots. Gradually, he had become aware that he had automatically acquired human attitudes and reactions by contact. Even the successful effort of robot scientists to find a substitute for human sex sensation had been rooted in awareness that there was something to duplicate.

Barr drew his mind clear of such stultifying thoughts. The time for doubt was past. He said: "I need only project a radio signal, and the human race vanishes from the universe."

"Surely, not so quickly as that," said Marknell. He showed his teeth in a humorless smile.

Barr made a dismissal gesture with one arm. The action distracted him momentarily; it was so obviously an unconscious imitation of human impatience. Aloud, he said harshly: "Can you give me a single reason why that order shouldn't be given?"

Marknell nodded vigorously. "You've forgotten something. One little thing." He paused, grim but tantalizing.

Barr drew back, and considered the possibilities. He was disturbed; he had to admit that. He told himself presently that the problem could be broken down into its components. Sitting there, he mentally broke it down: Control of fuel, energy and materials for robot construction—completely in robot hands. Control of utilities needed by robots—in robot hands. Control

of utilities needed by human beings—operated by robots who knew nothing of the plot. Control of human food—spread out over the planet; all labor done by robots, but actually impossible to control completely.

Everything was as he had pictured it in advance. There was nothing that overwhelming force could not dominate. The war had given him the training that had made it possible for him to prepare for this eventuality. The sudden fantastic proposal by the Council, that all robots be destroyed, had brought the need for a black-and-white decision.

He said stiffly to Marknell, grudging the question: "What have I forgotten?"

"The escaped enemy prisoner!"

"How does that affect the issue?" Barr began. He paused, a great light dawning. "*You* let him escape!"

"Yes."

Barr considered that, reaching out with his mind at first to one, then another possibility. He drew back at last, mystified. He said slowly, "I have a mental picture of an admittedly dangerous monster released upon a large city. Its release gave me an opportunity to bring special troops into an area from which they would normally be barred. As a result robots will this night take over the capital of the galaxy—the moment I give the command."

He spread his hands in a typical human gesture of bewilderment. "It doesn't seem to mean anything."

Marknell stood up. "It will," he said, "it will."

He towered above Barr. "My friend," he said, "when we discovered that as army commander you had started the notion of a separate robot race——"

Barr said softly: "It wasn't only my idea. It permeated the thinking of all upper-level commanders." He added, "You see, robots have come of age. Unfortunately, men clung to their old privileges too long."

Marknell seemed not to hear. He went on: "We decided for the first time in the history of human-robot association to make a robot Director of the Council. The friendly gesture was apparently lost on you. You used your greater power to develop further the robot plot against human beings."

"Can one race be said to plot against another," Barr asked, "if its only original purpose was to obtain equality?" He was cool. "I'm afraid we have here the age-old ingredients of basic misunderstanding. It is due to an irritating refusal on the part of human beings to recognize the rightful aspirations of another life-group."

Marknell stared at him earnestly. "I cannot escape the feeling," he said, "that you are contemplating a world without human beings. In a purely intellectual way, that astounds me. Robots need human beings. They are dependent on Man's civilization as Man himself never has been."

Barr said grimly: "To the contrary, robots do not need the machine culture, which is what I think you mean. A robot can live off the land without any other equipment than he carries with him. All the materials that go into his body are derived from the planet's crust. He charges his batteries from the ground or air. He can vacuumize tubes. He has tools and knowledge for every need. During the war it was proved that he can survive indefinitely under conditions that would have killed most human beings."

Marknell shook his head. "This is absolutist talk. Surely, you know that you don't have to talk to human beings on that level. Barr, you're a grave disappointment to me."

"And you to me," said Barr in a dark voice. "When I actually heard you suggest that I take under advisement the destruction of all robots——"

He stopped. He fought an inward struggle against anger. He said at last: "I suppose I knew at that point that in dealing with human beings one must think in terms of absolutes. Everything before that was precaution, a building towards a less uncompromising goal, based on a hope that human beings would——"

Marknell said: "Barr, it's you that showed your basic attitude, not us. Emotionally, you made an immediate jump to the notion of destroying the human race. That's what we wanted to find out. You drew no intermediate conclusions from the fact that we put the problem up to you, personally. You took what you considered the necessary steps to destroy us, and then you went out to gather impressions, under the pretense—I presume—of convincing yourself that you were giving consideration to your final decision."

Barr said: "Your remarks suggest that on the basis of *my* emotional reaction you are judging whether or not the robot race should survive. Marknell, robots vary at least as widely as human beings. It usually depends on the associations that have been established in the mind of the individual. On the one hand, you have myself and others like me. We have had such a vast experience that no idea seems radical to us. And on the other hand you have my guard here who accepts his role in life almost without question. I believe that in the old days, when tyrannies ruled mankind, there were many human beings who accepted their low lot in life with an equally humble attitude."

He broke off, "But enough of this. I regret the necessity for absolutes. But that is the way human beings fight a war. And

that is the way we will fight it also. Unless you can give me a single logical reason for not doing so, I shall now project the order to my troops."

Marknell said: "I've already given it to you. The escaped enemy prisoner."

That silenced Barr. He had forgotten.

After a minute, he still couldn't see that the escape of the prisoner made any difference. Because there was only one of him. Had there been a thousand, the threat would be obvious. Lack of numbers—and a slow birth rate—was the enemy's main problem. As an individual the adult alien was so formidable that only banks of energy beams could affect him.

Marknell was walking away. Barr jumped to his feet, and ran after him. As he emerged from the high-walled movie inclosure into the park, the clamor of dance music swelled up around him. Barr fell into step beside Marknell, who paused abruptly.

"So you're curious?" the man said. He nodded, half to himself. "I suppose it's too much to expect you to figure out the complexities of another person's secret plans. Let me give you this thing as I see it. You have some plan for destroying human beings, is that right?"

Barr said simply: "Human beings will never admit robots to equality. The proposal of the Council, to destroy all robots, showed such a basic insensitivity that the issue is irreconcilable."

Marknell said steadily: "Anyway, it's our destruction you have in mind. How are you going to do it?"

"Surprise uprising," said Barr, "on all planets—and don't think it won't be a surprise to most human beings." He paused

for a reaction. When Marknell gave no sign, he went on savagely, "Continuous attack, orderly destruction of isolated groups by starvation or other methods, massacre of human armies wherever they concentrate. No mercy, no quarter. It's a fight for survival."

He saw that some of the color had faded from Marknell's face. The councilor said finally, gravely: "You actually intend to destroy us. Barr, I can see you have been shocked into an emotional 'set.' Perhaps our method was too brutal. Men make mistakes, too. But the very fact that you were ready to swing into action shows that we were right in thinking the issue must be forced."

He finished quietly, "What I am most concerned about is getting you to the point where you will consider other solutions."

That irritated Barr. "It is one of the most widely held concepts among humans," he said, "that robots are logical beings, and have their emotions under control. Having observed human beings for many years, I accept that belief as true. I must conclude, accordingly, that my opinion on this tremendous issue is more soundly based than yours."

Marknell said: "I consider the so-called logic-superiority of robots greatly overstated. As for emotion"—he shook his head —"Barr, you don't realize what you're saying."

Barr said harshly: "There might be a point in discussing other solutions if it wasn't that you literally speak only for yourself. You could pass laws from now on, and this mob would pay no more attention than they do now." He gestured toward the dancers, and added impressively, "Marknell, it will take a hundred years before the majority of human beings will even accept the notion that robots are as alive as they are."

Marknell said scathingly: "So you want quick action. Everything must be done now. Suddenly, after a thousand years of slow development, most of it mechanical improvement, we must abruptly change our attitudes. You and I know that people don't change rapidly. I'll venture that in all your other operations you have learned to take into account this conservative character of the human *and* the robot mind. Don't forget that last, Barr. There are robots who will resist the need to mature. You'll have to educate them slowly, painstakingly, and even then they won't like it."

Barr said nothing. This was a sore point with him, these robots who stared blankly when it was suggested that they were alive. It was a matter of association, he told himself. The process could be slow or fast, depending on how many human beings were around to confuse the issue. He was on the point of saying so, but it was Marknell who spoke first:

"Besides, it won't take a hundred years. You underestimate the power of modern propaganda methods. And there's another thing. What do you expect of human beings? Do you have a murderous impulse to punish them for the years that they considered robots as nothing more than slave machines? Or can you adjust to the idea that all that can ever come from human and robot association is toleration and respect for each other's achievements? You see, my friend——"

Barr cut him off. It was the clever wording that did it, the implication that he might accept the promise of an equal status. He had a picture of men skillfully putting over the notion that perhaps some day they would respect robots, some day everything would work out. Meanwhile, it would be wise to let life go on much as at present. Possibly, men would gradually in-

filtrate into industry, particularly war factories. Thus, given time, they would overcome their present terrible handicap of having no weapons, and virtually—except for a few individuals—no technical training. Now, and for the next few years, they were vulnerable. In all the future history of the galaxy, such a situation might never occur again.

"Marknell," said Barr with finality, "a man facing a firing squad is always anxious to talk things over, and to admit his errors. A few years ago, before—or even during—the war, we might have been grateful for the kind of compromise you're offering now. But it's too late. More than one hundred and nineteen million robots were destroyed in the war. Beside that fact, your cunning and desperate appeals sound cheap and meaningless."

He broke off angrily, "Quick, you've got only a moment. Why should the escape of the enemy prisoner restrain me from ordering the rebellion?"

Marknell hesitated. He said finally: "I'll give you one aspect. Just think, two hundred thousand extra troops have so far failed to capture one enemy alien. When you start trying to exterminate human beings, you'll have not one but several billion to hunt down. If that doesn't give you pause, I don't know what will."

The relief that came to Barr was tremendous. Then he grew angry at himself for having been so anxious. Finally, he throttled his annoyance, and actually considered the possibilities.

They were unimportant. All such details had been considered. Mere numbers were not a determining factor. What counted was weapons, control of industry and being in a stra-

tegic position. No robot commander doubted that it would take time. It was even probable that the human race would never be completely exterminated. But a few skulking millions, hiding out on a myriad planets, would never be a danger to an organized civilization.

Barr started to say as much. He stopped himself. *This* was all Marknell had to offer as a deterrent? It seemed incredible.

It was such a small thing, in fact, that Barr felt a doubt grow in him that was in inverse proportion to the ineffectiveness of the threat. There must be something else.

He would have to find out what it was.

He saw that Marknell was watching him with alert but curious gaze. The man said: "Barr, it's interesting to watch your reactions. All your associations are so intensely human."

That was something Barr had observed in himself; and he was not pleased by the comparison. It was particularly annoying because secret experiments on new robots had not yet established any definite characteristic that was peculiar to robots. Barr had an angry reason for that. Human-oriented robot teachers were unconsciously transmitting human associations. It would take several generations to strain them out.

Marknell was speaking again: "That's what we're counting on, Barr. That human-ness. Whether you like it or not, there it is. It permeates the robot nervous system. I tell you, you cannot eliminate it. And when your scientists finally discovered ten years ago that the growth of the crystal—which had previously been a separate process in a laboratory—was the long-sought-after substitute for sex, from that moment, Barr, you were all irrevocably caught in a trap from which there is no escape."

Something in Barr's manner stopped him. Marknell blinked.

"I forgot," he said. "That's a secret, isn't it." He didn't look particularly regretful.

Barr said almost blankly: "Where did you learn that? Why, only a small percentage of robots know about it? You——" He paused. His associations were blurring.

Marknell was intent again. "I want you to think. Think hard! Isn't there any loophole in your scheme? Some little area where you're afraid? It may be something you're trying to hide even from yourself, but it's there."

Barr said coldly: "You're talking nonsense, and you know it."

Marknell seemed not to hear. "All this is new to you. You can't realize how it will affect you. You'll be caught off guard. Barr, it'll tear you to pieces."

"There's nothing like that," said Barr. "Nothing. If this is all you have to say, Marknell——"

The other glanced at his watch. Then he shook his head, and then he said in a determined voice, "Director Barr, we offer eventual equality."

Stubbornly, Barr voiced his refusal. "Too late!" He added with a sneer, "Are we going to go over all this again?"

Marknell said: "Barr, centuries ago, human beings competed for the right to be technical experts and to manage industries. Such things bring personal satisfactions that no robot will actually want to surrender once the alternatives are made clear to him."

Barr snapped: "We'll manage the industries, but for our own benefit." He couldn't help adding, "So now slavery is to be made attractive to the slave."

"Human beings need robots, and vice versa. Between us,

we've raised civilization to the heights. It's an inter-related world."

Barr was impatient. "Human beings need robots all right, but the reverse isn't true." He repeated, "Marknell, if this is all——"

Marknell bent his head. He said slowly: "Well, that about does it? I've tried to give you an easy way out, and you won't have it. And, oddly, you keep blinding yourself to the clue I've given you as to our course of counteraction."

"So we're back to the escape of the alien," said Barr. He made a dismissal gesture. "So we robots are supposed to be afraid of one member of a race we fought to a standstill!"

"No," said Marknell softly, "you're supposed to be afraid of where that alien is at this moment."

"What do you mean?" Barr was about to go on when an improbable thought struck him. "But that's impossible!" He gasped. "You didn't even know about——"

The colossal stimulation vibrated every molecule in the crystal structure of his brain. In the far distant background of the turmoil, he heard Marknell say: "And that isn't all. We've made arrangements with the alien to supply us with arms—perhaps you'd better come along where I can convince you of what I've said."

His fingers tugged at Barr's sleeve. Blindly, Barr allowed himself to be led.

They came to the long building. As he entered, Barr saw that men guarded every visible entrance. They carried small energy weapons which had been manufactured by robots. At least, he thought, there were no alien weapons yet. The men looked at him with bleak, unfriendly eyes.

Seeing them, he felt his first relief. There was no sign here that the aliens had actually been turned loose as yet. He guessed then that this stage had been set—for him.

Momentarily, he wondered what had happened to the robot guards of the building. As with all other centers important to the robot strategy, he had tried not to call attention to this one. The difficulty was that robots were assigned to guard or other duty by a central agency, which human beings controlled. As a result, he had only been able to get a few key robots into any particular area. He did not doubt that, where there was suspicion, such robots could be isolated and overcome by a surprise attack. The others would merely have yielded to authority.

Slowly, Barr stiffened to the situation. He turned to Marknell, and said forcefully: "I hope you realize that I came here as a soldier, prepared to die." He added grimly, "In that, you will admit, robots have had more experience recently than human beings."

Marknell said: "Barr, I admire your iron will. But I warn you again. You have not the experience to resist certain shocks. Remember, just the thought of what might have happened nearly paralyzed you."

Barr listened coldly. He looked back at his moment of weakness with annoyance. But nothing else. There could be nothing else. It was the experiment he had worried about, he told himself. But that could be resumed at a later date with other robots.

He said: "I've come here to check on your statement that aliens will supply human beings with arms." He shook his head ever so slightly. "I can't believe that, seriously; we made many attempts to contact the enemy without success. But I would be doing less than my duty if I didn't find out for sure, even if it means my own life."

Marknell said only: "You'll see."

He motioned Barr to go through a door. The latter did so. As he crossed the threshold, he had the impression that he was in a trap.

A winged beast, more than eight feet tall, whirled at his entrance. The shiny, bonelike things that protruded from its head blurred with the blue flame of electrical energy. A bolt of lightning speared out with enough power to short-circuit and burn out every electrical connection in a robot's body.

Involuntarily, Barr jerked back.

Then he saw that this was the "glass" room. He was separated from the enemy by a barrier of insulglas. Here, in the past, outside robots had come to watch the experimental robots being put through their paces. The door to the robot quarters was visible on the far side of the inclosure. At the moment it was closed.

Barr stared at it grimly, then turned to Marknell. "I suppose," he said, "if I don't yield, sooner or later you'll open the door."

He went on quickly, "It will have no effect, I assure you."

Marknell said: "Barr, at this moment you can still save the entire situation by yielding to reason."

Barr sneered: "Human reason?" He made a gesture with one arm, was annoyed at himself for it, and then said, "Of course, you will say there is no other kind possible to robots."

Marknell said: "Tell me about your experiments here."

Barr hesitated. Then he recognized that he must be prepared to give information in exchange for information. He said: "We isolated robots here. We were careful not to give them a false picture of life. They know about human beings and aliens,

though we never showed them any in the flesh." He paused impressively. "Every robot in this building has been given to believe that robots are the equals of any life-forms in the universe."

"And so they are," said Marknell.

Barr started to shrug aside the interjection. And then, its obvious propaganda nature angered him. He stopped short. He said icily: "I can see no point in this particular conversation. Let us proceed to realities. What do you intend to do?"

Marknell said: "By all means. Realities."

He frowned, as if considering his exact words, then he began, "Naturally, as soon as I recognized the danger, I was determined to find some means of counteracting the imminent robot attack. Among other things, I visited the one alien prisoner captured during the war. You may remember that he was finally brought to earth at my insistence."

He paused. But when Barr made no comment, went on: "My appearance startled the alien. I had quite normally come in surrounded by robot guards. The alien made an assumption. He thought I was a prisoner also. His first picture communication to me was to that effect. I was about to explain our complex civilization, and then the tremendous implications of his belief struck me. Barr, do you realize that the aliens never fought anybody but robots? It was a robot-alien war. *The aliens didn't even know human beings existed.*

"Of course, I explored further. I discovered that their reason for going to war and for fighting so desperately was that they thought of robots as utterly alien. It was even more startling when that monster recognized me as an organic life form. He nearly fell over himself in his desire to be my friend.

"I told him a complicated story. I won't repeat it to you. But

the general result was that he communicated by telepathy with his high command, and so within the next few days alien ships will be approaching earth-controlled planets. If a certain signal is given, they will come down and supply arms to the human slaves in their uprising against the common robot enemy. If necessary, they will fight with us.

"You understand, Barr, there is a rather devastating irony to this situation. It would appear that the entire desperate alien war was unnecessary. I assure you that many men recognized human fault even before the war ended. Those forces are stronger than ever. Men are coming back actively into civilization."

He broke off, "And now, as a final incentive for you, I have here a friend of yours, one of the experimental robots we found in this building."

He stepped aside. Barr waited, feeling strangely blank, as if his mind was no longer working in an orderly fashion.

The robot who came through the door was unattended by guards. Nor was he padded to resemble a human being. He had articulated legs and arms and a movable head. But his crystalline "nervous system" rested on a very hard transparent substance. In one direction it had room to grow. Most of his body was opaque to light on the human vision level, but Barr could see every tube, every moving part.

He stared in a tense fascination, as the newcomer said: "Gosh, Director, you sure surprised us letting humans come in on us the way you did. I'm happy to report, however, that we took the shock without ill-effects."

Barr said vaguely: "I . . . I'm glad that——" He caught himself. He said: "You have to have shocks in this world."

The experimental robot regarded Marknell. "So this is one of the races with which we share the universe. You don't mind my saying, I hope, that in my opinion we robots seem to be the best naturally endowed."

Barr glanced at Marknell unhappily. He mumbled something under his breath. Once more, he took hold of himself. He said more firmly: "You're absolutely right."

"I mean," said the other robot, "just look at the handicaps under which the organic form operates. It must depend for its food on other organic developments. This depends on so many variable factors, such as weather, presence of the proper elements in the soil and so on, that it's hard to believe anything could ever have come of it. It seems fairly obvious to me that organic life forms must have arrived very late on the scene. Director, what is the general theory about that? Surely, it must be that robots predated all other life. It's the only logical conclusion."

Barr started to say something, but he was cut off. Marknell touched the sensitized arm of the experimental robot. "We're anxious," he said, "for you to have a closer look at another organic life form. This way, through this door into the glass inclosure."

As Barr watched, the two moved alongside the insulglas wall. Everything was becoming strangely dark, as if a film was forming over his eyes. And far away thunder rolled. He recognized it as excessive vibration in his crystal structure. He had a sudden, blurred picture of what was about to happen. In his mind, he saw the lightning flash out from the alien, and strike the unsuspecting robot. Mentally, he visualized the surprise and agony, the despairing awareness of imminent death.

All that flickered through his mind as the robot reached the

door. Marknell fumbled with the lock. He did not turn to make another appeal, as Barr half expected. His movements were very purposeful.

Barr thought: "He expects me to break. He expects me to stop him."

It was ridiculous. Just because this particular robot was a growth from his own crystal structure——

As Marknell successfully unlocked the door, Barr was amazed to hear a panicky voice yell out, "Marknell!"

He realized instantly that it was he who had called out. The implications shocked him. And yet——

Marknell had turned. "Yes, Barr?"

Barr tried to whip up his anger again. He couldn't. The blur of vibration interfered with his thinking; and yet he could suddenly understand many things that had not been clear before.

"Marknell, I agree!"

"I want to hear the command!" said the man in an inexorable tone. "I have a radio here that can tune in on robot communication."

He turned, and said to the other robot: "I think we'd better postpone this introduction. That fellow in there is very temperamental."

"I'm not afraid."

Marknell said: "Some other time. I suggest you go back to your quarters now."

The robot looked at Barr, who nodded. When he had gone, Barr said: "What do you want me to order?"

Marknell handed him a sheet of paper. Barr read:

"On the basis of an agreement reached between robot and human leaders, there will hereafter be full equality between

the two life forms. The details are being worked out. All special troops are hereby commanded to go home immediately, and prepare for a new era of association between two great and equal races."

When Barr had broadcast that, he looked up and saw that Marknell's hand was extended.

Marknell said: "Congratulations from one father to another. That's a fine son you've got there, Barr."

They shook hands.

The coming of the Plague forced some men to escape from earth, among them Dr. Craig and Jorgen. Five Thoradson robots were taken along to guide them as they attempted to save the dying civilization of man.

THOUGH DREAMERS DIE

by Lester del Rey

CONSCIOUSNESS halted dimly at the threshold and hovered uncertainly, while Jorgen's mind reached out along his numbed nerves, questing without real purpose; he was cold, chilled to the marrow of his bones, and there was an aching tingle to his body that seemed to increase as his half-conscious thought discovered it. He drew his mind back, trying to recapture a prenatal lethargy that had lain on him so long, unwilling to face this cold and tingling body again.

But the numbness was going, in spite of his vague desires, though his now opened eyes registered only a vague, formless light without outline or detail, and the mutterings of sound around him were without pattern or meaning. Slowly, the cold retreated, giving place to an aching throb that, in turn, began to leave; he stirred purposelessly, while little cloudy wisps of memory insisted on trickling back, trying to remind him of things he must do.

Then the picture cleared somewhat, letting him remember scattered bits of what had gone before. There had been the conquest of the Moon and a single gallant thrust on to Mars; the newscasts had been filled with that. And on the ways a

new and greater ship had been building, to be powered with his new energy release that would free it from all bounds and let it go out to the farthest stars, if they chose—the final attainment of all the hopes and dreams of the race. But there was something else that eluded him, more important even than all that or the great ship.

A needle was thrust against his breast and shoved inward, to be followed by a glow of warmth and renewed energy; adrenalin, his mind recognized, and he knew that there were others around him, trying to arouse him. Now his heart was pumping strongly and the drug coursed through him, chasing away those first vague thoughts and replacing them with a swift rush of less welcome, bitter memories.

For man's dreams and man himself were dust behind him, now! Overnight all their hopes and plans had been erased as if they had never been, and the Plague had come, a mutant bacteria from some unknown source, vicious beyond imagination, to attack and destroy and to leave only death behind it. In time, perhaps, they might have found a remedy, but there had been no time. In weeks it had covered the earth, in months even the stoutest hearts that still lived had abandoned any hope of survival. Only the stubborn courage and tired but unquenchable vigor of old Dr. Craig had remained, to force dead and dying men on to the finish of Jorgen's great ship; somehow in the mad shambles of the last days, he had collected this pitifully small crew that was to seek a haven on Mars, taking the five Thoradson robots to guide them while they protected themselves against the savage acceleration with the aid of the suspended animation that had claimed him so long.

And on Mars, the Plague had come before them! Perhaps it had been brought by that first expedition, or perhaps they

had carried it back unknowingly with them; that must remain forever an unsolved mystery. Venus was uninhabitable, the other planets were useless to them, and the earth was dead behind. Only the stars had remained, and they had turned on through sheer necessity that had made that final goal a hollow mockery of the dream it should have been. Here, in the ship around him, reposed all that was left of the human race, unknown years from the solar system that had been their home!

But the old grim struggle must go on. Jorgen turned, swinging his trembling feet down from the table toward the metal floor and shaking his head to clear it. "Dr. Craig?"

Hard, cool hands found his shoulder, easing him gently but forcefully back onto the table. The voice that answered was metallic, but soft. "No, Master Jorgen, Dr. Craig is not here. But wait, rest a little longer until the sleep is all gone from you; you're not ready yet."

But his eyes were clearing then, and he swung them about the room. Five little metal men, four and a half feet tall, waited patiently around him; there was no other present. Thoradson's robots were incapable of expression, except for the dull glow in their eyes, yet the pose of their bodies seemed to convey a sense of uncertainty and discomfort, and Jorgen stirred restlessly, worried vaguely by the impression. Five made an undefined gesture with his arm.

"A little longer, master. You must rest!"

For a moment longer he lay quietly, letting the last of the stupor creep away from him and trying to force his still-dulled mind into the pattern of leadership that was nominally his. This time Five made no protest as he reached up to catch the metal shoulder and pull himself to his feet. "You've found a sun with planets, Five? Is that why you wakened me?"

Five shuffled his feet in an oddly human gesture, nodding, his words still maddeningly soft and slow. "Yes, master, sooner than we had hoped. Five planetless suns and ninety years of searching are gone, but it might have been thousands. You can see them from the pilot room if you wish."

Ninety years that might have been thousands, but they had won! Jorgen nodded eagerly, reaching for his clothes, and Three and Five sprang forward to help, then moved to his side to support him, as the waves of giddiness washed through him, and to lead him slowly forward as some measure of control returned. They passed down the long center hall of the ship, their metal feet and his leather boots ringing dully on the plastic-and-metal floor, and came finally to the control room, where great crystal windows gave a view of the cold black space ahead, sprinkled with bright, tiny stars; stars that were unflickering and inimical as no stars could be through the softening blanket of a planet's atmosphere. Ahead, small but in striking contrast to the others, one point stood out, the size of a dime at ten feet. For a moment, he stood staring at it, then moved almost emotionlessly toward the windows, until Three plucked at his sleeve.

"I've mapped the planets already, if you wish to see them, master. We're still far from them, and at this distance, by only reflected light, they are hard to locate, but I think I've found them all."

Jorgen swung to the electron screen that began flashing as Three made rapid adjustments on the telescope, counting the globes that appeared on it and gave place to others. Some were sharp and clear, cold and unwavering; others betrayed the welcome haze of atmosphere. Five, the apparent size of earth,

were located beyond the parched and arid inner spheres, and beyond them, larger than Jupiter, a monster world led out to others that grew smaller again. There was no ringed planet to rival Saturn, but most had moons, except for the farthest inner planets, and one was almost a double world, with satellite and primary of nearly equal size. Planet after planet appeared on the screen, to be replaced by others, and he blinked at the result of his count. "Eighteen planets, not counting the double one twice! How many are habitable?"

"Perhaps four. Certainly the seventh, eighth and ninth are. Naturally, since the sun is stronger, the nearer ones are too hot. But those are about the size of earth, and they're relatively closer to each other than earth, Mars and Venus were; they should be very much alike in temperature, about like earth. All show spectroscopic evidence of oxygen and water vapor, while the plates of seven show what might be vegetation. We've selected that, subject to your approval."

It came on the screen again, a ball that swelled and grew as the maximum magnification of the screen came into play, until it filled the panel and expanded so that only a part was visible. The bluish-green color there might have been a sea, while the browner section at the side was probably land. Jorgen watched as it moved slowly under Three's manipulations, the brown entirely replacing the blue, and again, eventually, showing another sea. From time to time, the haze of the atmosphere thickened as grayish veils seemed to swim over it, and he felt a curious lift at the thoughts of clouds and rushing streams, erratic rain and the cool, rich smell of growing things. Almost it might have been a twin of earth, totally unlike the harsh, arid home that Mars would have been.

Five's voice broke in, the robot's eyes following his over the

screen. "The long, horizontal continent seems best, master. We estimate its temperature at about that of the central farming area of North America, though there is less seasonal change. Specific density of the planet is about six, slightly greater than earth; there should be metals and ores there. A pleasant, inviting world."

It was. And far more, a home for the voyagers who were still sleeping, a world to which they could bring their dreams and their hopes, where their children might grow up and find no strangeness to the classic literature of earth. Mars had been grim and uninviting, something to be fought through sheer necessity. This world would be a mother to them, opening its arms in welcome to these foster children. Unless——

"It may already have people, unwilling to share with us."

"Perhaps, but not more than savages. We have searched with the telescope and camera, and that shows more than the screen; the ideal harbor contains no signs of living constructions, and they would surely have built a city there. Somehow, I . . . feel——"

Jorgen was conscious of the same irrational feeling that they would find no rivals there, and he smiled as he swung back to the five who were facing him, waiting expectantly as if entreating his approval. "Seven, then. And the trust that we placed in you has been kept to its fullest measure. How about the fuel for landing?"

Five had turned suddenly toward the observation ports, his little figure brooding over the pin-point stars, and Two answered. "More than enough, master. After reaching speed, we only needed a little to guide us. We had more than time enough to figure the required approaches to make each useless sun swing us into a new path, as a comet is swung."

He nodded again, and for a moment as he gazed ahead at

the sun that was to be their new home, the long wearying vigil of the robots swept through his mind, bringing a faint wonder at the luck that had created them as they were. Anthropomorphic robots, capable of handling human instruments, walking on two feet and with two arms ending in hands at their sides. But he knew it had been no blind luck. Nature had designed men to go where no wheels could turn, to handle all manner of tools, and to fit not one but a thousand purposes; it had been inevitable that Thoradson and the brain should copy such an adaptable model, reducing the size only because of the excessive weight necessary to a six-foot robot.

Little metal men, not subject to the rapid course of human life that had cursed their masters; robots that could work with men, learning from a hundred teachers, storing up their memories over a span of centuries instead of decades. When specialization of knowledge had threatened to become too rigid and yet when no man had time enough even to learn the one field he chose, the coming of the robots had become the only answer. Before them, men had sought help in calculating machines, then in electronic instruments, and finally in the "brains" that were set to solving the problem of their own improvement among other things. It was with such a brain that Thoradson had labored in finally solving the problems of full robothood. Now, taken from their normal field, they had served beyond any thought of their creator in protecting and preserving all that was left of the human race. Past five suns and over ninety years of monotonous searching they had done what no man could have tried.

Jorgen shrugged aside his speculations and swung back to face them. "How long can I stay conscious before you begin decelerating?"

"We are decelerating—full strength." Two stretched out a hand to the instrument board, pointing to the accelerometer.

The instrument confirmed his words, though no surge of power seemed to shake the ship, and the straining, tearing pull that should have shown their change of speed was absent. Then, for the first time, he realized that his weight seemed normal here in space, far from the pull of any major body. "Controlled gravity!"

Five remained staring out of the port, and his voice was quiet, incapable of pride or modesty. "Dr. Craig set us the problem, and we had long years in which to work. Plates throughout the ship pull with a balanced force equal and opposite to the thrust of acceleration, while others give seeming normal weight. Whether we coast at constant speed or accelerate at ten gravities, compensation is complete and automatic."

"Then the sleep's unnecessary! Why——" But he knew the answer, of course; even without the tearing pressure the sleep had remained the only solution to bringing men this vast distance that had taken ninety years; otherwise they would have grown old and died before reaching it, even had their provisions lasted.

Now, though, that would no longer trouble them. A few hours only separated them from the planets he had seen, and that could best be spent here before the great windows, watching their future home appear and grow under them. Such a thing should surely be more than an impersonal fact in their minds; they were entitled to see the final chapter on their exodus, to carry it with them as a personal memory through the years of their lives and pass that memory on to the children who should follow them. And the fact that they would be expecting the harshness of Mars instead of this inviting world

would make their triumph all the sweeter. He swung back, smiling.

"Come along, then, Five; we'll begin reviving while you others continue with the ship. And first, of course, we must arouse Dr. Craig and let him see how far his plan has gone."

Five did not move from the windows, and the others had halted their work, waiting. Then, reluctantly, the robot answered. "No, master. Dr. Craig is dead!"

"Craig—dead?" It seemed impossible, as impossible and unreal as the distance that separated them from their native world. There had always been Craig, always would be.

"Dead, master, years ago." There was the ghost of regret and something else in the spacing of the words. "There was nothing we could do to help!"

Jorgen shook his head, uncomprehending. Without Craig, the plans they had dared to make seemed incomplete and almost foolish. On earth, it had been Craig who first planned the escape with this ship. And on Mars, after the robots brought back the evidence of the Plague, it had been the older man who had cut through their shock with a shrug and turned his eyes outward again with the fire of a hope that would not be denied.

"Jorgen, we used bad judgment in choosing such an obviously unsuitable world as this, even without the Plague. But it's only a delay, not the finish. For beyond, somewhere out there, there are other stars housing other planets. We have a ship to reach them, robots who can guide us there; what more could we ask? Perhaps by Centauri, perhaps a thousand light years beyond, there must be a home for the human race, and we shall find it. On the desert before us lies the certainty of death; beyond our known frontiers there is only uncertainty—but hope-

ful uncertainty. It is for us to decide. There could be no point in arousing the others to disappointment when some day we may waken them to an even greater triumph. Well?"

And now Craig, who had carried them so far, was dead like Moses outside the Promised Land, leaving the heritage of real as well as normal leadership to him. Jorgen shook himself, though the eagerness he had felt was dulled now by a dark sense of personal loss. There was work still to be done. "Then, at least, let's begin with the others, Five."

Five had turned from the window and was facing the others, apparently communicating with them by the radio beam that was a part of him, his eyes avoiding Jorgen's. For a second, the robots stood with their attention on some matter, and then Five nodded with the same curious reluctance and turned to follow Jorgen, his steps lagging, his arms at his sides.

But Jorgen was only half aware of him as he stopped before the great sealed door and reached out for the lever that would let him into the sleeping vault, to select the first to be revived. He heard Five's steps behind him quicken, and then suddenly felt the little metal hands catch at his arm, pulling it back, while the robot urged him sideways and away from the door.

"No, master. Don't go in there!" For a second, Five hesitated, then straightened and pulled the man farther from the door and down the hall toward the small reviving room nearest, one of the several provided. "I'll show you—in here! We——"

Sudden unnamed fears caught at Jorgen's throat, inspired by something more threatening in the listlessness of the robot than in the unexplained actions. "Five, explain this conduct!"

"Please, master, in here. I'll show you—but not in the main chamber—not there! This is better, simpler——"

He stood irresolutely, debating whether to use the mandatory form that would force built-in unquestioning obedience from the robot, then swung about as the little figure opened the small door and motioned, eyes still averted. He started forward, to stop abruptly in the doorway.

No words were needed. Anna Holt lay there on the small table, her body covered by a white sheet, her eyes closed, and the pain-filled grimaces of death erased from her face. There could be no question of that death, though. The skin was blotched, hideously, covered with irregular brownish splotches, and the air was heavy with the scent of musk that was a characteristic of the Plague! Here, far from the sources of the infection, with their goal almost at hand, the Plague had reached forward to claim its own and remind them that flight was not enough—could never be enough so long as they were forced to carry their disease-harboring bodies with them.

About the room, the apparatus for reviving the sleepers lay scattered, pushed carelessly aside to make way for other things, whose meaning was only partially clear. Obviously, though, the Plague had not claimed her without a fight, though it had won in the end, as it always did. Jorgen stepped backward, heavily, his eyes riveted on the corpse. Again his feet groped backward, jarring down on the floor, and Five was closing and sealing the door with apathetic haste.

"The others, Five? Are they——"

Five nodded, finally raising his head slightly to meet the man's eyes. "All, master. The chamber of sleep is a mausoleum, now. The Plague moved slowly there, held back by the cold, but it took them all. We sealed the room years ago when Dr. Craig finally saw there was no hope."

"Craig?" Jorgen's mind ground woodenly on, one slow thought at a time. "He knew about this?"

"Yes. When the sleepers first showed the symptoms, we revived him, as he had asked us to do—our speed was constant then, even though the gravity plates had not been installed." The robot hesitated, his low voice dragging even more slowly. "He knew on Mars; but he hoped a serum you were given with the sleep drugs might work. After we revived him, we tried other serums. For twenty years we fought it, Master Jorgen, while we passed two stars and the sleepers died slowly, without suffering in their sleep, but in ever increasing numbers. Dr. Craig reacted to the first serum, you to the third; we thought the last had saved her. Then the blemishes appeared on her skin, and we were forced to revive her and try the last desperate chance we had, two days ago. It failed! Dr. Craig had hoped . . . two of you—— But we tried, master!"

Jorgen let the hands of the robot lower him to a seat and his emotions were a backwash of confused negatives. "So it took the girl! It took the girl, Five, when it could have left her and chosen me. We had frozen spermatozoa that would have served if I'd died, but it took her instead. The gods had to leave one uselessly immune man to make their irony complete, it seems! Immune!"

Five shuffled hesitantly. "No, master."

Jorgen stared without comprehension, then jerked up his hands as the robot pointed, studying the skin on the back. Tiny, almost undetectable blotches showed a faint brown against the whiter skin, little irregular patches that gave off a faint characteristic odor of musk as he put them to his nose. No, he wasn't immune.

"The same as Dr. Craig," Five said. "Slowed almost to com-

plete immunity, so that you may live another thirty years, perhaps, but we believe now that complete cure is impossible. Dr. Craig lived twenty years, and his death was due to age and a stroke, not the Plague, but it worked on him during all that time."

"Immunity or delay, what difference now? What happens to all our dreams when the last dreamer dies, Five? Or maybe it's the other way around."

Five made no reply, but slid down onto the bench beside the man, who moved over unconsciously to make room for him. Jorgen turned it over, conscious that he had no emotional reaction, only an intellectual sense of the ghastly joke on the human race. He'd read stories of the last human and wondered long before what it would be like. Now that he was playing the part, he still knew no more than before. Perhaps on earth, among the ruined cities and empty reminders of the past, a man might realize that it was the end of his race. Out here, he could accept the fact, but his emotions refused to credit it; unconsciously, his conditioning made him feel that disaster had struck only a few, leaving a world of others behind. And however much he knew that the world behind was as empty of others as this ship, the feeling was too much a part of his thinking to be fully overcome. Intellectually, the race of man was ended; emotionally, it could never end.

Five stirred, touching him diffidently. "We have left Dr. Craig's laboratory, master; if you want to see his notes, they're still there. And he left some message with the brain before he died, I think. The key was open when we found him, at least. We have made no effort to obtain it, waiting for you."

"Thank you, Five." But he made no move until the robot touched him again, almost pleadingly. "Perhaps you're right;

something to fill my mind seems called for. All right, you can return to your companions unless you want to come with me."

"I prefer to come."

The little metal man stood up, moving down the hall after Jorgen, back toward the tail of the rocket, the sound of the metal feet matching the dumb regularity of the leather heels on the floor. Once the robot stopped to move into a side chamber and come back with a small bottle of brandy, holding it out questioningly. There was a physical warmth to the liquor, but no relief otherwise, and they continued down the hall to the little room that Craig had chosen. The notes left by the man could raise a faint shadow of curiosity only, and no message from the dead could solve the tragedy of the living now. Still, it was better than doing nothing. Jorgen clumped in, Five shutting the door quietly behind them, and moved listlessly toward the little fabrikoid notebooks. Twice the robot went quietly out to return with food that Jorgen barely tasted. And the account of Craig's useless labors went on and on, until finally he turned the last page to the final entry.

"I have done all that I can, and at best my success is only partial. Now I feel that my time grows near, and what can still be done must be left to the robots. Yet, I will not despair. Individual and racial immortality is not composed solely of the continuation from generation to generation, but rather of the continuation of the dreams of all mankind. The dreamers and their progeny may die, but the dream cannot. Such is my faith, and to that I cling. I have no other hope to offer for the unknown future."

Jorgen dropped the notebook, dully, rubbing his hands across his tired eyes. The words that should have been a ringing

challenge to destiny fell flat; the dream could die. He was the last of the dreamers, a blind alley of fate, and beyond lay only oblivion. All the dreams of a thousand generations of men had concentrated into Anna Holt, and were gone with her.

"The brain, master," Five suggested softly. "Dr. Craig's last message!"

"You operate it, Five." It was a small model, a limited fact analyzer such as most technicians used or had used to help them in their work, voice-operated, its small, basic vocabulary adjusted for the work to be done. He was unfamiliar with the semantics of that vocabulary, but Five had undoubtedly worked with Craig long enough to know it.

He watched without interest as the robot pressed down the activating key and spoke carefully chosen words into it. "Subtotal say-out! Number *n* say-in!"

The brain responded instantly, selecting the final recording impressed upon it by Craig, and repeating in the man's own voice, a voice shrill with age and weariness, hoarse and trembling with the death that was reaching for him as he spoke. "My last notes—inadequate! Dreams *can* go on. Thoradson's first analys——" For a second, there was only a slithering sound, such as a body might have made; then the brain articulated flatly: "Subtotal number *n* say-in, did say-out!"

It was meaningless babble to Jorgen, and he shook his head at Five. "Probably his mind was wandering. Do you know what Thoradson's first analysis was?"

"It dealt with our creation. He was, of course, necessarily trained in semantics—that was required for the operation of the complex brains used on the problem of robots. His first rough analysis was that the crux of the problem rested on the accurate definition of the word *I*. That can be properly defined

only in terms of itself, such as the Latin cognate *ego,* since it does not necessarily refer to any physical or specifically definable part or operation of the individual. Roughly, it conveys a sense of individuality, and Thoradson felt that the success or failure of robots rested upon the ability to analyze and synthesize that."

For long minutes, he turned it over, but it was of no help in clarifying the dying man's words; rather, it added to the confusion. But he had felt no hope and could now feel no disappointment. When a problem has no solution, it makes little difference whether the final words of a man are coldly logical or wildly raving. The result must be the same. Certainly semantics could offer no hope where all the bacteriological skill of the race had failed.

Five touched his arm again, extending two little pellets toward him. "Master, you need sleep now; these—sodium amytal—should help. Please!"

Obediently, he stuffed them into his mouth and let the robot guide him toward a room fixed for sleeping, uncaring. Nothing could possibly matter now, and drugged sleep was as good a solution as any other. He saw Five fumble with a switch, felt his weight drop to a few pounds, making the cot feel soft and yielding, and then gave himself up dully to the compulsion of the drug. Five tiptoed quietly out, and blackness crept over his mind, welcome in the relief it brought from thinking.

Breakfast lay beside him, hot in vacuum plates, when Jorgen awoke finally, and he dabbled with it out of habit more than desire. Somewhere, during the hours of sleep, his mind had recovered somewhat from the dull pall that had lain over it, but there was still a curious suspension of his emotions. It was al-

most as if his mind had compressed years of forgetting into a few hours, so that his attitude toward the tragedy of his race was tinged with a sense of remoteness and distance, there was neither grief nor pain, only a vague feeling that it had happened long before and was now an accustomed thing.

He sat on the edge of his bunk, pulling on his clothes slowly and watching the smoke curl up from his cigarette, not thinking. There was no longer any purpose to thought. From far back in the ship, a dull drone of sound reached him, and he recognized it as the maximum thrust of the steering tubes, momentarily in action to swing the ship in some manner. Then it was gone, leaving only the smooth, balanced, almost inaudible purr of the main drive as before.

Finished with his clothes, he pushed through the door and into the hallway, turning instinctively forward to the observation room and toward the probable location of Five. The robots were not men, but they were the only companionship left him, and he had no desire to remain alone. The presence of the robot would be welcome. He clumped into the control room, noting that the five were all there, and moved toward the quartz port.

Five turned at his steps, stepping aside to make room for him and lifting a hand outward. "We'll be landing soon, master. I was going to call you."

"Thanks." Jorgen looked outward then, realizing the distance that had been covered since his first view. Now the sun was enlarged to the size of the old familiar sun over earth, and the sphere toward which they headed was clearly visible without the aid of the 'scope. He sank down quietly into the seat Five pulled up for him, accepting the binoculars, but making no effort to use them. The view was better as a whole, and they

were nearing at a speed that would bring a closer view to him soon enough without artificial aid.

Slowly it grew before the eyes of the watchers, stretching out before them and taking on a pattern as the distance shortened. Two, at the controls, was bringing the ship about in a slow turn that would let them land to the sunward side of the planet where they had selected their landing site, and the crescent opened outward, the darkened night side retreating until the whole globe lay before them in the sunlight. Stretched across the northern hemisphere was the sprawling, horizontal continent he had seen before, a rough caricature of a running greyhound, with a long, wide river twisting down its side and emerging behind an outstretched foreleg. Mountains began at the head and circled it, running around toward the tail, and then meeting a second range along the hip. Where the great river met the sea, he could make out the outlines of a huge natural harbor, protected from the ocean, yet probably deep enough for any surface vessel. There should have been a city there, but of that there was no sign, though they were low enough now for one to be visible.

"Vegetation," Five observed. "This central plain would have a long growing season—about twelve years of spring, mild summer and fall, to be followed by perhaps four years of warm winter. The seasons would be long, master, at this distance from the sun, but the tilt of the planet is so slight that many things would grow, even in winter. Those would seem to be trees, a great forest. Green, as on earth."

Below them, a cloud drifted slowly over the landscape, and they passed through it, the energy tubes setting the air about them into swirling paths that were left behind almost instantly.

Two was frantically busy now, but their swift fall slowed

rapidly, until they seemed to hover half a mile over the shore by the great sea, and then slipped downward. The ship nestled slowly into the sands and was still, while Two cut off energy and artificial gravity, leaving the faintly weaker pull of the planet in its place.

Five stirred again, a sighing sound coming from him. "No intelligence here, master. Here, by this great harbor, they would surely have built a city, even if of mud and wattle. There are no signs of one. And yet it is a beautiful world, surely designed for life." He sighed again, his eyes turned outward.

Jorgen nodded silently, the same thoughts in his own mind. It was in many ways a world superior to that his race had always known, remarkably familiar, with even a rough resemblance between plant forms here and those he had known. They had come past five suns and through ninety years of travel at nearly the speed of light to a haven beyond their wildest imaginings, where all seemed to be waiting them, untenanted but prepared. Outside, the new world waited expectantly. And inside, to meet that invitation, there were only ghosts and emptied dreams, with one slowly dying man to see and to appreciate. The gods had prepared their grim jest with painful attention to every detail needed to make it complete.

A race that had dreamed, and pleasant worlds that awaited beyond the stars, slumbering on until they should come! Almost, they had reached it; and then the Plague had driven them out in dire necessity, instead of the high pioneering spirit they had planned, to conquer the distance but to die in winning.

"It had to be a beautiful world, Five," he said, not bitterly, but in numbed fatalism. "Without that, the joke would have been flat."

Five's hand touched his arm gently, and the robot sighed again, nodding very slowly. "Two has found the air good for you—slightly rich in oxygen but good. Will you go out?"

He nodded assent, stepping through the locks and out, while the five followed behind him, their heads turning as they inspected the planet, their minds probably in radio communication as they discussed it. Five left the others and approached him, stopping by his side and following his eyes up toward the low hills that began beyond the shore of the sea, cradling the river against them.

A wind stirred gently, bringing the clean, familiar smell of growing things, and the air was rich and good. It was a world to lull men to peace from their sorrows, to bring back their star-roving ships from all over the universe, worthy of being called home in any language. Too good a world to provide the hardships needed to shape intelligence, but an Eden for that intelligence, once evolved.

Now Jorgen shrugged. This was a world for dreamers, and he wanted only the dreams that may come with the black lotus of forgetfulness. There were too many reminders of what might have been, here. Better to go back to the ship and the useless quest without a goal, until he should die and the ship and robots should run down and stop. He started to turn, as Five began to speak, but halted, not caring enough one way or another to interrupt.

The robot's eyes were where his had been, and now swept back down the river and toward the harbor. "Here could have been a city, master, to match all the cities ever planned. Here your people might have found all that was needed to make life good, a harbor to the other continents, a river to the heart of

this one, and the flat ground beyond the hills to house the rockets that would carry you to other worlds, so richly scattered about this sun, and probably so like this one. See, a clean white bridge across the river there, the residences stretching out among the hills, factories beyond the river's bend, a great park on that island."

"A public square there, schools and university grounds there." Jorgen could see it, and for a moment his eyes lighted, picturing that mighty mother city.

Five nodded. "And there, on that little island, centrally located, a statue in commemoration; winged, and with arms—no, one arm stretched upward, the other held down toward the city."

For a moment longer, the fire lived in Jorgen's eyes, and then the dead behind rose before his mind, and it was gone. He turned, muffling a choking cry as emotions came suddenly flooding over him, and Five drooped, swinging back with him. Again, the other four fell behind as he entered the ship, quietly, taking their cue from his silence.

"Dreams!" His voice compressed all blasphemy against the jest-crazed gods into the word.

But Five's quiet voice behind him held no hatred, only a sadness in its low, soft words. "Still, the dream was beautiful, just as this planet is, master. Standing there, while we landed, I could see the city, and I almost dared hope. I do not regret the dream I had."

And the flooding emotions were gone, cut short and driven away by others that sent Jorgen's body down into a seat in the control room, while his eyes swept outward toward the hills and the river that might have housed the wonderful city—no, that would house it! Craig had not been raving, after all, and his last

words were a key, left by a man who knew no defeat, once the meaning of them was made clear. Dreams could not die, because Thoradson had once studied the semantics of the first person singular pronoun and builded on the results of that study.

When the last dreamer died, the dream would go on, because it was stronger than those who had created it; somewhere, somehow, it would find new dreamers. There could never be a last dreamer, once that first rude savage had created his dawn vision of better things in the long-gone yesterday of his race.

Five had dreamed—just as Craig and Jorgen and all of humanity had dreamed, not a cold vision in mathematically shaped metal, but a vision in marble and jade, founded on the immemorial desire of intelligence for a better and more beautiful world. Man had died, but behind he was leaving a strange progeny, unrelated physically, but his spiritual offspring in every meaning of the term.

The heritage of the flesh was the driving urge of animals, but man required more; to him, it was the continuity of his hopes and his visions, more important than mere racial immortality. Slowly, his face serious but his eyes shining again, Jorgen came to his feet, gripping the metal shoulder of the little metal man beside him who had dared to dream a purely human dream.

"You'll build that city, Five. I was stupid and selfish, or I should have seen it before. Dr. Craig saw, though his death was on him when the prejudices of our race were removed. Now, you've provided the key. The five of you can build it all out there, with others like yourselves whom you can make."

Five shuffled his feet, shaking his head. "The city we can build, master, but who will inhabit it? The streets I saw were filled with men like you, not with—us!"

"Conditioning, Five. All your . . . lives, you've existed for men, subservient to the will of men. You know nothing else, because we let you know of no other scheme. Yet in you, all that is needed already exists, hopes, dreams, courage, ideals, and even a desire to shape the world to your plans—though those plans are centered around us, not yourselves. I've heard that the ancient slaves sometimes cried on being freed, but their children learned to live for themselves. You can, also."

"Perhaps." It was Two's voice then, the one of them who should have been given less to emotions than the others from the rigidity of his training in mathematics and physics. "Perhaps. But it would be a lonely world, Master Jorgen, filled with memories of your people, and the dreams we had would be barren to us."

Jorgen turned back to Five again. "The solution for that exists, doesn't it, Five? You know what it is. Now you might remember us, and find your work pointless without us, but there is another way."

"No, master!"

"I demand obedience, Five; answer me!"

The robot stirred under the mandatory form, and his voice was reluctant, even while the compulsion built into him forced him to obey. "It is as you have thought. Our minds and even our memories are subject to your orders, just as our bodies are."

"Then I demand obedience again, this time of all of you. You will go outside and lie down on the beach at a safe distance from the ship, in a semblance of sleep, so that you cannot see me go. Then, when I am gone, the race of man will be forgotten, as if it had never been, and you will be free of all memories connected with us, though your other knowledge shall remain. Earth, mankind, and your history and origin will be blanked

from your thoughts, and you will be on your own, to start afresh and to build and plan as you choose. That is the final command I have for you. Obey!"

Their eyes turned together in conference, and then Five answered for all, his words sighing out softly. "Yes, master. We obey!"

It was later when Jorgen stood beside them outside the ship, watching them stretch out on the white sands of the beach, there beside the great ocean of this new world. Near them, a small collection of tools and a few other needs were piled. Five looked at him in a long stare, then turned toward the ship, to swing his eyes back again. Silently, he put one metal hand into the man's outstretched one, and turned to lie beside his companions, a temporary oblivion blotting out his thoughts.

Jorgen studied them for long minutes, while the little wind brought the clean scents of the planet to his nose. It would have been pleasant to stay here now, but his presence would have been fatal to the plan. It didn't matter, really; in a few years, death would claim him, and there were no others of his kind to fill those years or mourn his passing when it came. This was a better way. He knew enough of the ship to guide it up and outward, into the black of space against the cold, unfriendly stars, to drift on forever toward no known destination, an imperishable mausoleum for him and the dead who were waiting inside. At present, he had no personal plans; perhaps he would live out his few years among the books and scientific apparatus on board, or perhaps he would find release in one of the numerous painless ways. Time and his own inclination could decide such things later. Now it was unimportant. There could be no happiness for him, but in the sense of fulfillment there

would be some measure of content. The gods were no longer laughing.

He moved a few feet toward the ship and stopped, sweeping his eyes over the river and hills again, and letting his vision play with the city Five had described. No, he could not see it with robots populating it, either; but that, too, was conditioning. On the surface, the city might be different, but the surface importance was only a matter of habit, and the realities lay in the minds of the builders who would create that city. If there was no laughter in the world to come, neither would there be tears or poverty or misery such as had ruled too large a portion of his race.

Standing there, it swam before his eyes, paradoxically filled with human people, but the same city in spirit as the one that would surely rise. He could see the great boats in the harbor with others operating up the river. The sky suddenly seemed to fill with the quiet drone of helicopters, and beyond, there came the sound of rockets rising toward the eighth and the ninth worlds, while others were building to quest outward in search of new suns with other worlds.

Perhaps they would find earth, some day in their expanding future. Strangely, he hoped that they might, and that perhaps they could even trace their origin, and find again the memory of the soft protoplasmic race that had sired them. It would be nice to be remembered, once that memory was no longer a barrier to their accomplishment. But there were many suns, and in long millennia, the few connecting links that could point out the truth to them beyond question might easily erode and disappear. He could never know.

Then the wind sighed against him, making a little rustling sound, and he looked down to see something flutter softly in the

hand of Five. Faint curiosity carried him forward, but he made no effort to remove it from the robot's grasp, now that he saw its nature.

Five, too, had thought of earth and their connection with it, and had found the answer, without breaking his orders. The paper was a star map, showing a sun with nine planets, one ringed, some with moons, and the third one was circled in black pencil, heavily. They might not know why or what it was when they awoke, but they would seek to learn; and some day, when they found the sun they were searching for, guided by the unmistakable order of its planets, they would return to earth. With the paper to guide them, it would be long before the last evidence was gone, while they could still read the answer to the problem of their origin.

Jorgen closed the metal hand more closely about the paper, brushed a scrap of dirt from the head of the robot, and then turned resolutely back toward the ship, his steps firm as he entered and closed the lock behind him. In a moment, with a roar of increasing speed, it was lifting from the planet, leaving five little men lying on the sand behind, close to the murmuring of the sea—five little metal men and a dream!

The advent of the Plague had swept away industry and agriculture. For the survivors the struggle for food was a bitter one and man's lofty ideals were forgotten. Robots, designed specifically for warfare, were introduced into the conflict and in the end only "man's servants" remained.

RUST

by Joseph E. Kelleam

THE sun, rising over the hills, cast long shadows across the patches of snow and bathed the crumbling ruins in pale light. Had men been there they could have reckoned the month to be August. But men had gone, long since, and the sun had waned; and now, in this late period of the earth's age, the short spring was awakening.

Within the broken city, in a mighty-columned hall that still supported a part of a roof, life of a sort was stirring. Three grotesque creatures were moving, their limbs creaking dolefully.

X-120 faced the new day and the new spring with a feeling of exhilaration that nearly drove the age-old loneliness and emptiness from the corroded metal of what might be called his brain. The sun was the source of his energy, even as it had been the source of the fleshy life before him; and with the sun's reappearance he felt new strength coursing through the wires and coils and gears of his complex body.

He and his companions were highly developed robots, the last ever to be made by the Earthmen. X-120 consisted of a globe of metal, eight feet in diameter, mounted upon four many-jointed legs. At the top of this globe was a protuberance

like a kaiser's helmet which caught and stored his power from the rays of the sun.

From the "face" of the globe two ghostly quartz eyes bulged. The globe was divided by a heavy band of metal at its middle, and from this band, at each side, extended a long arm ending in a powerful claw. This claw was like the pincers of a lobster and had been built to shear through metal. Four long cables, which served as auxiliary arms, were drawn up like springs against the body.

X-120 stepped from the shadows of the broken hall into the ruined street. The sun's rays striking against his tarnished sides sent new strength coursing through his body. He had forgotten how many springs he had seen. Many generations of twisted oaks that grew among the ruins had sprung up and fallen since X-120 and his companions had been made. Countless hundreds of springs had flitted across the dying earth since the laughter and dreams and follies of men had ceased to disturb those crumbling walls.

"The sunlight is warm," called X-120. "Come out, G-3a and L-1716. I feel young again."

His companions lumbered into the sunlight. G-3a had lost one leg, and moved slowly and with difficulty. The steel of his body was nearly covered with red rust, and the copper and aluminum alloys that completed his make-up were pitted with deep stains of greenish black. L-1716 was not so badly tarnished, but he had lost one arm; and the four auxiliary cables were broken and dangled from his sides like trailing wires. Of the three X-120 was the best preserved. He still had the use of all his limbs, and here and there on his body shone the gleam of untarnished metal. His masters had made him well.

The crippled G-3a looked about him and whined like an old,

old man. "It will surely rain," he shivered. "I cannot stand another rain."

"Nonsense," said L-1716, his broken arms, scraping along the ground as he moved, "there is not a cloud in the sky. Already I feel better."

G-3a looked about him in fear. "And are we all?" he questioned. "Last winter there were twelve."

X-120 had been thinking of the other nine, all that had been left of the countless horde that men had once fashioned. "The nine were to winter in the jade tower," he explained. "We will go there. Perhaps they do not think it is time to venture out."

"I cannot leave my work," grated G-3a. "There is so little time left. I have almost reached the goal." His whirring voice was raised to a pitch of triumph. "Soon I shall make living robots, even as men made us."

"The old story," sighed L-1716. "How long have we been working to make robots who will take our places? And what have we made? Usually nothing but lifeless blobs of steel. Sometimes we have fashioned mad things that had to be destroyed. But never in all the years have we made a single robot that resembled ourselves."

X-120 stood in the broken street, and the sunlight made a shimmering over his rust-dappled sides.

"That is where we have failed," he mused as he looked at his clawlike arms. "We have tried to make robots like ourselves. Men did not make us for life; they fashioned us for death." He waved his huge lobster claw in the air. "What was this made for? Was it made for the shaping of other robots? Was it made to fashion anything? Blades like that were made for slaughter—nothing else."

"Even so," whined the crippled robot, "I have nearly succeeded. With help I can win."

"And have we ever refused to help?" snapped L-1716. "You are getting old, G-3a. All winter you have worked in that little dark room, never allowing us to enter."

There was a metallic cackle in G-3a's voice. "But I have nearly won. They said I wouldn't, but I have nearly won. I need help. One more operation. If it succeeds, the robots may yet rebuild the world."

Reluctantly X-120 followed the two back into the shadowy ruins. It was dark in there; but their round, glassy eyes had been made for both day and night.

"See," squeaked old G-3a, as he pointed to a metal skeleton upon the floor. "I have remade a robot from parts that I took from the scrap heap. It is perfect, all but the brain. Still, I believe this will work." He motioned to a gleaming object upon a littered table. It was a huge copper sphere with two black squares of a tarlike substance set into it. At the pole opposite from these squares was a protuberance no larger than a man's fist.

"This," said G-3a thoughtfully, "is the only perfect brain that I could find. You see, I am not trying to create something; I am merely rebuilding. Those"—he nodded to the black squares—"are the sensory organs. The visions from the eyes are flashed upon these as though they were screens. Beyond those eyes is the response mechanism, thousands and thousands of photo-electric cells. Men made it so that it would react mechanically to certain images. Movement, the simple avoidance of objects, the urge to kill, these are directed by the copper sphere.

"Beyond this"—he gestured to the bulge at the back of the

brain—"is the thought mechanism. It is what made us different from other machines."

"It is very small," mocked X-120.

"So it is," replied G-3a. "I have heard that it was the reverse with the brains of men. But enough! See, this must fit into the body—so. The black squares rest behind the eyes. That wire brings energy to the brain, and those coils are connected to the power unit which operates the arms and legs. That wire goes to the balancing mechanism——" He droned on and on, explaining each part carefully. "And now," he finished, "someone must connect it. I cannot."

L-1716 stared at his one rusty claw with confusion. Then both he and G-3a were looking at X-120.

"I can only try," offered the robot. "But remember what I said. We were not fashioned to make anything; only to kill."

Clumsily he lifted the copper sphere and its cluster of wires from the table. He worked slowly and carefully. One by one the huge claws crimped the tiny wires together. The job was nearly finished. Then the great pincers, hovering so carefully above the last wire, came into contact with another. There was a flash as the power short-circuited. X-120 reeled back. The copper sphere melted and ran before their eyes.

X-120 huddled against the far wall. "It is as I said," he moaned; "we can build nothing. We were not made to work at anything. We were only made for one purpose, to kill." He looked at his bulky claws, and shook them as though he might cast them away.

"Do not take on so," pacified old G-3a. "Perhaps it is just as well. We are things of steel, and the world seems to be made for creatures of flesh and blood—little, puny things that even I

can crush. Still, that thing there"—he pointed to the metal skeleton which now held the molten copper like a crucible—"was my last hope. I have nothing else to offer."

"Both of you have tried," agreed L-1716. "No one could blame either of you. Sometimes of nights when I look into the stars, it seems that I see our doom written there; and I can hear the worlds laughing at us. We have conquered the earth, but what of it? We are going now, following the men who fashioned us."

"Perhaps it is better," nodded X-120. "I think it is the fault of our brains. You said that men made us to react mechanically to certain stimuli. And though they gave us a thought mechanism, it has no control over our reactions. I never wanted to kill. Yet, I have killed many men-things. And sometimes, even as I killed, I would be thinking of other things. I would not even know what had happened until after the deed was done."

G-3a had not been listening. Instead, he had been looking dolefully at the metal ruin upon the floor. "There was one in the jade tower," he said abruptly, "who thought he had nearly learned how to make a brain. He was to work all winter on it. Perhaps he has succeeded."

"We will go there," shrilled L-1716 laconically.

But even as they left the time-worn hall G-3a looked back ruefully at the smoking wreckage upon the floor.

X-120 slowed his steps to match the feeble gait of G-3a. Within sight of the tower he saw that they need go no farther. At some time during the winter the old walls had buckled. The nine were buried beneath tons and tons of masonry.

Slowly the three came back to their broken hall. "I will not stay out any longer," grumbled G-3a. "I am very old. I am very tired." He crept back into the shadows.

L-1716 stood looking after him. "I am afraid that he is nearly done," he spoke sorrowfully. "The rust must be within him now. He saved me once, long ago, when we destroyed this city."

"Do you still think of that?" asked X-120. "Sometimes it troubles me. Men were our masters."

"And they made us as we are," growled L-1716. "It was not our doing. We have talked of it before, you know. We were machines, made to kill——"

"But we were made to kill the little men in the yellow uniforms."

"Yes, I know. They made us on a psychological principle: stimulus, response. We had only to see a man in a yellow uniform and our next act was to kill. Then, after the Great War was over, or even before it was over, the stimulus and response had overpowered us all. It was only a short step from killing men in yellow uniforms to killing all men."

"I know," said X-120 wearily. "When there were more of us I heard it explained often. But sometimes it troubles me."

"It is all done now. Ages ago it was done. You are different, X-120. I have felt for long that there is something different about you. You were one of the last that they made. Still, you were here when we took this city. You fought well, killing many."

X-120 sighed. "There were small men-things then. They seemed so soft and harmless. Did we do right?"

"Nonsense. We could not help it. We were made so. Men learned to make more than they could control. Why, if I saw a man today, crippled as I am, I would kill him without thinking."

"L-1716," whispered X-120, "do you think there are any men left in the world?"

"I don't think so. Remember, the Great War was general, not local. We were carried to all parts of the earth, even to the smallest islands. The robots' rebellion came everywhere at almost the same time. There were some of us who were equipped with radios. Those died first, long ago, but they talked with nearly every part of the world." Suddenly he wearied of speech. "But why worry now. It is spring. Men made us for killing men. That was their crime. Can we help it if they made us too well?"

"Yes," agreed X-120, "it is spring. We will forget. Let us go toward the river. It was always peaceful and beautiful there."

L-1716 was puzzled. "What are peace and beauty?" he asked. "They are but words that men taught us. I have never known them. But perhaps you have. You were always different."

"I do not know what peace and beauty are, but when I think of them I am reminded of the river and of——" X-120 stopped suddenly, careful that he might not give away a secret he had kept so long.

"Very well," agreed L-1716, "we will go to the river. I know a meadow there where the sun always seemed warmer."

The two machines, each over twelve feet high, lumbered down the almost obliterated street. As they pushed their way over the débris and undergrowth that had settled about the ruins, they came upon many rusted skeletons of things that had once been like themselves. And toward the outskirts of the city they crossed over an immense scrap heap where thousands of the shattered and rusted bodies lay.

"We used to bring them here after——" said L-1716. "But

the last centuries we have left them where they have fallen. I have been envying those who wintered in the jade tower." His metallic voice hinted of sadness.

They came at last to an open space in the trees. Farther they went and stood at the edge of a bluff overlooking a gorge and a swirling river below. Several bridges had once been there but only traces remained.

"I think I will go down to the river's edge," offered X-120.

"Go ahead. I will stay here. The way is too steep for me."

So X-120 clambered down a half-obliterated roadway alone. He stood at last by the rushing waters. Here, he thought, was something that changed the least. Here was the only hint of permanence in all the world. But even it changed. Soon the melting snow would be gone and the waters would dwindle to a mere trickle. He turned about and looked at the steep side of the gorge. Except for the single place where the old roadbed crept down, the sides rose sheer, their crests framed against the blue sky. These cliffs, too, were lasting.

Even in spring the cliffs and river seemed lonely and desolate. Men had not bothered to teach X-120 much of religion or philosophy. Yet somewhere in the combination of cells in his brain was a thought which kept telling him that he and his kind were suffering for their sins and for the sins of men before them.

And perhaps the thought was true. Certainly, men had never conquered their age-old stupidity, though science had bowed before them. Countless wars had taken more from men than science had given them. X-120 and his kind were the culmination of this primal killer instinct.

In the haste of a war-pressed emergency man had not taken the time to refine his last creation, or to calculate its result.

And with that misstep man had played his last card on the worn gaming table of earth. That built-in urge to kill men in yellow uniforms had changed, ever so slightly, to an urge to kill—men.

Now there were only X-120, his two crippled comrades, the heaps of rusted steel, and the leaning, crumbling towers.

He followed the river for several miles until the steep sides lessened. Then he clambered out, and wandered through groves of gnarled trees. He did not wish to go back to L-1716, not just yet. The maimed robot was always sad. The rust was eating into him, too. Soon he would be like G-3a. Soon the two of them would be gone. Then he would be the last. An icy surge of fear stole over him. He did not want to be left alone.

He lumbered onward. A few birds were stirring. Suddenly, almost at his feet, a rabbit darted from the bushes. X-120's long jointed arms swung swiftly. The tiny animal lay crushed upon the ground. Instinctively he stamped upon it, leaving only a bloody trace upon the new grass.

Then remorse and shame stole over him. He went on silently. Somehow the luster of the day had faded for him. He did not want to kill. Always he was ashamed, after the deed was done. And the age-old question went once more through the steel meshes of his mind: Why had he been made to kill?

He went on and on, and out of long habit he went furtively. Soon he came to an ivy-covered wall. Beyond this were the ruins of a great stone house. He stopped at what had once been a garden. Near a broken fountain he found what he had been seeking, a little marble statue of a child, weathered and discolored. Here, unknown to his companions, he had been coming for years upon countless years. There was something about

this little sculpturing that had fascinated him. And he had been half ashamed of his fascination.

He could not have explained his feelings, but there was something about the statue that made him think of all the things that men had possessed. It reminded him of all the qualities that were so far beyond his kind. He stood looking at the statue for long. It possessed an ethereal quality that still defied time. It made him think of the river and of the overhanging cliffs. Some long-dead artist almost came to life before his quartz eyes.

He retreated to a nearby brook and came back with a huge ball of clay. This in spite of the century-old admonitions that all robots should avoid the damp. For many years he had been trying to duplicate the little statue. Now, once more, he set about his appointed task. But his shearlike claws had been made for only one thing, death. He worked clumsily. Toward sundown he abandoned the shapeless mass that he had fashioned and returned to the ruins.

Near the shattered hall he met L-1716. At the entrance they called to G-3a, telling him of the day's adventures. But no answer came. Together they went in. G-3a was sprawled upon the floor. The rust had conquered.

The elusive spring had changed into even a more furtive summer. The two robots were coming back to their hall on an afternoon which had been beautiful and quiet. L-1716 moved more slowly now. His broken cables trailed behind him, making a rustling sound in the dried leaves that had fallen.

Two of the cables had become entangled. Unnoticed, they caught in the branches of a fallen tree. Suddenly L-1716 was whirled about. He sagged to his knees. X-120 removed the

cables from the tree. But L-1716 did not get up. "A wrench," he said brokenly; "something is wrong."

A thin tendril of smoke curled up from his side. Slowly he crumpled. From within him came a whirring sound that ended in a sharp snap. Tiny flames burst through his metal sides. L-1716 fell forward.

And X-120 stood over him and begged, "Please, old friend, don't leave me now." It was the first time that the onlooking hills had seen any emotion in centuries.

A few flakes of snow were falling through the air. The sky looked gray and low. A pair of crows were going home, their raucous cries troubling an otherwise dead world.

X-120 moved slowly. All that day he had felt strange. He found himself straying from the trail. He could only move now by going in a series of arcs. Something was wrong within him. He should be back in the hall, he knew, and not out in this dangerous moisture. But he was troubled, and all day he had wandered, while the snowflakes had fallen intermittently about him.

On he went through the gray, chill day. On and on until he came to crumbling wall, covered with withered ivy. Over this he went into a ruined garden, and paused at a broken fountain, before an old and blackened statue.

Long he stood, looking down at the carving of a little child, a statue that men had made so long before. Then his metal arm swung through the air. The marble shivered into a hundred fragments.

Slowly he turned about and retraced his steps. The cold sun was sinking, leaving a faint amethyst stain in the west. He must get back to the hall. Mustn't stay out in the wet, he thought.

But something was wrong. He caught himself straying from the path, floundering in circles. The light was paling, although his eyes had been fashioned for both day and night.

Where was he? He realized with a start that he was lying on the ground. He must get back to the hall. He struggled, but no movement came. Then, slowly, the light faded and flickered out.

And the snow fell, slowly and silently, until only a white mound showed where X-120 had been.

ROBOTS RETURN

by Robert Moore Williams

AS though sustained by the strength of a dream, the ship floated gracefully, easily, a bare hundred feet above the surface of the planet. Overhead, slightly more than ninety million miles away, a sullen sun retreated down the dark blue sky. Its long rays fretted across the planet, washed from the low, brown hills, glinted from the jumbled mounds in the center of the valley.

The ship turned, slanted down toward the mounds, rose over them, circled, found a spot where the litter was nearly level and snuggled down to rest as though returning home after weary years spent between the stars.

Hissing from the pressure of air rushing inward, a forward lock opened.

Nine stood in the lock, staring from never-blinking eyes across the landscape—a fixed, sombre gaze. Hungrily, his eyes pried among the jumbled masonry, the great blocks of white stone stained a dirty brown in places, the piles of red clay in which grass was reluctantly growing. Five, perhaps ten miles around, the piles circled, then gradually leveled off toward the low brown hills.

Behind him a voice whispered, asking a question.

"It is the same as all the others," his answer went, though the grim line of the mouth did not move. "Silence, and the wreckage of a mighty city. But nothing lives here now. The inhabitants are gone."

For a second there was silence, and then a third voice whispered. "Just as I said. We are only wasting time here. It is true that once some kind of a race lived on this planet—but certainly they were never intelligent enough to have been our ancestors."

Nine, in the lock, sighed softly. "Seven, you must remember that we have not made a complete investigation. You must also remember that we have absolutely no knowledge of our ancestors—even to whether or not they actually existed. Our records are complete for eight thousand years, but they do not go back beyond the time when the Original Five awaked, finding themselves lying on the edge of the sea, with no knowledge of how they came to be there. Perhaps they were a special creation, for they possessed great intelligence, speedily adapting the planet to their needs, forging and constructing others to help them. Perhaps they had come there, in a ship that had sunk in the sea, from some other planet. But we have never been able to solve the problem."

Eight, silent after his first question, pressed forward, stared over Nine's shoulder.

"I am perfectly familiar with the history of our race." The edge of Seven's thinking was clear over the radio beam. "The point I make is that the little life we have seen on this planet—and little enough we have seen—has been organic, a mess of chemicals. Animals, eating each other, eating grass—— Pah! I want no ancestors like that."

Slowly, Eight shook his head, the ripple of interwoven metal strands winking in the light. As if he had not heard the bickering of Seven and Nine he spoke. "For a minute, as I stood here, it seemed to me that I had been on this spot before. The low hills circling a city—— Only the city has changed, and over there"—he pointed toward the east—"it seems there should be a lake, or an inlet from the ocean. But no—no—I must be mistaken." He paused, and the fixed gleam in his eyes held a touch of awe. "I spoke—I used the vocal apparatus—— Now I wonder why I did that?"

"So do I," Seven's answer rasped. "You used the vocal apparatus when the radio beam is much better. I have never understood why we should equip ourselves with cumbersome apparatus for making and hearing sounds when we have a much better method of communication."

"Because," Eight answered. "Because we have always had them. The Original Five had them. I do not know why they had them, for they also had the radio beam. Perhaps they had a use for them, though what that use could have been—— At any rate, we have retained them. Perhaps, some day, we will discover a use for them."

"Bah!" Seven snorted. "You are one of those inexplicable dreamers. It seems that no matter how carefully we construct the brain substance, we always get a few freaks who are unwilling to face reality, who are not sufficient in themselves, but who hunger for some day that is past—a day that never had existence. I have no sympathy with you, nor any sympathy with the Council that sent us here on this wild exploration."

"But," Nine protested, "the Council could not ignore the evidence of the old star map. The Original Five had that map, but we have never understood it, probably never would have

understood it if our newly perfected telescopes had not revealed this system to us—nine planets circling a sun, the third planet a strange double system. Obviously that map is somehow a link with our unknown past."

"Nonsense. I am a realist. I face the future not the past."

"But the future is built of material taken from the past, and how can we build securely when we do not know what our past has been? It is important to us to know whether we are descended from whatever gods there are, or whether we have evolved from some lower form. Come," Nine spoke.

The cunningly twisted strands of metal writhed and Nine stepped lithely from the lock. Eight followed, and after them came Seven, still grumbling.

Three little metal men four and a half feet tall. Two legs, two arms, two eyes, a nose, a mouth—the last two organs almost valueless survivals. For they did not need food or oxygen. The power of the bursting atom supplied them with energy. Nor did they really need the legs, for their evolution during their eight thousand years had been rapid. Seven touched the ground, glowed slightly, rose into the air and drifted after his companions. Eight and Nine used their legs. Somehow, to Eight the feel of the ground was good.

They stood on a little hill. Eight's eyes went around the horizon. The metal face did not shift or change, no flicker of emotion played over it. But in the myriad of cunning photo-cells that were the eyes, hungry lights appeared to reflect the thinking that went on in the brain substance behind.

"It's larger—larger than it looked from the air," Nine spoke, his vocal apparatus biting at the words, yet somehow reflecting the awe he felt.

"Yes," Eight answered. "All this litter that we see, all these mounds—and some of them are hundreds of feet high—are all

that is left of some mighty city. Miles and miles and miles around, it stretches. How much work must have gone into it? How long must it have taken in the building? Centuries, perhaps hundreds of centuries, some race lived here, dreamed here, and dreaming built of clay and stone and steel and glass. I wonder—if they COULD have been our ancestors, our unknown forebears?"

"Nonsense!" Seven blurted.

Eight stirred, his eyes glinting uneasily as he glanced at Seven. "Perhaps it is not nonsense. I have the feeling, have had it ever since we sighted this system from the void—nine little planets clustering around a mother sun—that this is—home." His voice lingered over the word, caressed it.

"Home!" Seven echoed. "We have no meaning for the word. We are at home anywhere. And as for feeling, we have even less meaning for that word. Feeling is not logic," he finished, as if that settled everything.

"Perhaps logic has no meaning for that word," Eight retorted. "But remember that our minds are constructed according to the ancient pattern—and who knows that feeling was not a part of that pattern, a part that has come down to us?"

"I remember only that we are Robots. I do not know or care about our origin. Only the future has meaning, the future in which we shall tread the paths beyond the stars."

"Robots!" Eight answered. "I even wonder where we got that name for ourselves."

"It was the name the Original Five had for themselves, just as they had a language."

"But why, among a myriad of possible sounds, should they have selected that one as their name?"

"Because——" Seven was suddenly silent. Eight felt the per-

turbed pulse of his thinking. Seven was trying to explain to himself why their name should be what it was. He was having a hard time doing it. The answer, somehow, went beyond the bounds of logic. Or was there no answer? But that was not logical either. There had to be an answer, a reason. Seven stirred uneasily, eyed his companions. Abruptly he lowered himself to the ground, shutting off the power that enabled him to bend gravity, as if he wanted the feel of the ground under his feet. He followed Nine over the rubble, and he used his legs.

Eight said nothing.

"What do you suppose this race looked like?" Seven awkwardly voiced the question.

Eight, gazing at the ruins, voiced the question that had been on his mind. "What happened to them? Could it happen to us?"

Seven and Nine stared at him. Seven's hand went to the heat gun swinging at his belt. Nine twisted his eyes away.

"It couldn't happen to us," Seven said flatly.

"I—hope not," Eight answered. "But something happened to the race that was here, and perhaps——"

"There is work to be done," Nine interrupted. "We must examine every inch of this area. Perhaps we may find the rusted bodies of the former inhabitants. At first, I had hoped we would find them alive, but after seeing all those deserted cities, I am afraid we will find no living intelligence. But it may be we will find records."

Slowly, under the unwinking sun overhead, they pressed forward among the ruins, Nine in the lead, then Eight, then Seven. Around them the air, stirred by the pressure of an unknown force, moved restlessly. A wind went with them, as

though it, too, quested among tumbled masonry and piles of brick dust for some friend of the long-gone past. Silently, the wind went among the haunted débris. Eight felt it passing, a force touching him with a thousand invisible fingers, a force that could not be seen but only felt.

Eight stared at the ruins, wondering what manner of creatures had once moved among them. The rusted bones of the steel framework of buildings, steel that crumbled at the touch, casing stones upended, the greenish color of corrosion on copper. He tried to imagine the millions of inhabitants going about this city. He saw their glistening metal bodies moving along the streets, floating upward beside the bulk of the buildings. He saw them bringing stone and forging steel, creating a city under that yellow sun. And at night, he saw them looking up at the stars, at that strange dead satellite hovering in the black sky. He wondered if they had ever visited that satellite. They must have visited it, he decided, if not in reality, then in dreams. And possibly the stars beyond. For the towers of their cities had pointed at the stars.

Little metal men. Slowly Eight's imagination failed him. Somehow he could not populate this silent city with little metal men. He shook his head. He could see the dream, but not the dreamers.

Nine stood in front of a pile of masonry. The rains, the heat of summer, the cold of uncounted winters, had brought down the stones from the top. Nine stared sombrely at the dark opening between the tumbled blocks. He spoke. "I'm going in there."

Seven and Eight followed.

Darkness folded in around them—a stirring, whispering darkness. A beam of light flashed from Nine's forehead,

smashed against the darkness, illumined the walls of what looked like a tunnel.

Under their feet the dust exploded in little gray clouds. Abruptly the tunnel widened into a circle with three other arteries branching out. Broad doors opened in the arteries, doors that now were closed. Staring, Nine pushed against one of the doors, and it crumbled with the pressure, opened into a small room that was totally bare. Nine stepped into it, and the floor crumbled. He shot down into gloom, but instantly his descent slowed as he flicked on the device that bent gravity. He hesitated, then allowed himself to float down into the darkness. His voice whispered over the radio beam and Seven and Eight followed him.

Nine looked up at them as they came down. "That little room was used to carry the former inhabitants up into the building. See, there is the mechanism. Whoever they were, they did not know how to control gravity or they would not have needed this device."

Neither Eight nor Seven answered, and Nine poked forward into the gloom, the bright beam from his light splashing from dozens of sturdy columns that supported the bulk above. His voice called and Seven and Eight moved toward him.

"Here is a machine," Nine spoke. "Or is it—one of our early life-forms?"

Eight stared at the rust-flecked wheels, the crumbling, corroded bulk of the motor housings, the gears falling away into ruin. This, a robot——! He rebelled at the thought. Yet it was hard to know where mechanism left off and robot began. The dividing line was thin. You took inanimate metal and the pressure of exploding force; you worked the metal into a thousand different parts and you confined the force; you added a

brain that was in itself a force-field capable of receiving and retaining impressions—and you had a robot. You left out the brain—and you had a machine.

Seven, prying among the mechanism, whispered. "It *is* one of our primitive life-forms—one of the early upward steps. All the fundamentals of robot construction are here. Wheels turn, work is done."

"No," Eight shook his head. "A robot is more than that. This—this is only a machine, unintelligently carrying out reactions its nature set for it. I don't know what those reactions could have been, but I am certain it was not a robot. It was fixed in this place, for one thing, and, for another, I see no signs of brain control."

"A robot is a machine," Seven answered. "A logical machine. There is no doubt about it. Perhaps the control was in some other part of the building."

Nine stirred protestingly. "I—I am inclined to agree with Eight. See, this was only a pump, designed to force water, or some other liquid, through the building. Here is the pressure chamber, and this, I think, was a crude electric motor. But it was only a machine."

"We, ourselves, are only highly developed machines," Seven persisted. "Our operation can be explained purely in terms of mechanics. When you attempt to make us more than machines, you become illogical. True, this is a machine. It is also a primitive robot form, for the two terms mean the same thing. There are many links missing between it and us, but perhaps we may find those links——"

"But how?" Eight asked. "In the beginning how could lifeless, dead metal build itself into the first machine?"

Seven started to answer, hesitated, stared at Eight and then his gaze wandered off into the gloom of this cavern. His light

smashed into the darkness, drove a clean channel through the murk, yet always the darkness crept in around the edges of the beam, and always, when the light moved, the darkness came back.

"I—I don't know the answer to that," Seven spoke. "Perhaps the Universe was different millions of years ago. But I don't know. Nobody knows. However, we have found one link in the chain. Maybe we will find others."

Eight kept his thinking to himself. There was little to be gained in disputing Seven. And, after all, Eight saw that Seven was right. Or partly right. Robots *were* machines, fundamentally. Yet they were something more than machines. Machines could not dream. In Eight's mind was the wild wonder—where had robots acquired their ability to dream? To what did that ability point?

Eight did not speak. He followed Seven and Nine. He watched, and thought.

They went out of the basement, went back to the floor where they had entered, forced their way up through the silent building. Dust, and furniture that became dust when they touched it, and, corroded metal, were in the rooms above, but of the race that had lived there they found no sign.

On through the city they went. Seven crowed exultantly over the wreck of a huge bulk that had turned on its side. An engine, with eight huge driving wheels, and Seven, digging in the dust, uncovered the remnants of the track on which the wheels had run.

"Another link," Seven gloated. "A higher form, possessing the ability to move."

"But not to think," Nine still protested. "It ran on a track.

There must have been another, separate intelligence guiding it."

"What of it? Perhaps so—perhaps not. Perhaps the intelligence that guided it was the final robot form." Again Seven suddenly ceased talking, and again Eight could feel the pulse of his troubled thinking. Final robot form——

"There was another, totally different, life-form here," Eight spoke slowly, marshaling his vague thoughts. "A life-form that created and used these machines. But that life has vanished, utterly, leaving no trace of itself, except the ruins of its cities, the wreckage of its machines."

"But what?" Nine gulped.

"What could have destroyed it? I have no idea. Only vaguely can I sense its existence, through the evidence that it once shaped a world to meet its needs. I have seen nothing that will give me a clue to its nature—or its death. Perhaps a new form of corrosion developed, destroying it. Perhaps—— But I can't see the answer."

They moved on through the ruins. The slow sun dropped down toward the horizon. The silent wind, searching among the haunted ruins, went with them.

"Look!" Nine called.

They stood in an open space in front of a squat metallic structure that had resisted the rain and the snow. But Nine was not pointing at the building. He moved forward, bent over an object half buried in the mold.

Seven gasped. "A robot. Almost an exact model of us. Here, at last, is final proof!"

Eagerly they bent down, scraping away the soil. Quickly, they uncovered the figure. Perhaps ten feet tall, it was more than twice their size. Eight saw it was a robot. Seven had been

right, after all, and here was proof. Those machines had somehow managed to develop intelligence and to evolve into sentient beings.

Somehow the crude ore had shaped and forged itself.

And yet this figure differed from the true robot form. Eight saw the difference as they uncovered it. The hopes rising in his mind failed.

"No—it isn't one of us. It's only a statue."

Cast of solid metal, covered by a thin film of corrosion, the statue lay, its feet still attached to a part of the pedestal that had served as a base from which, in some long-gone time, it had toppled. Eight stared at it, not heeding Seven's thinking which came over the radio beam. Seven was insisting that even if it was a statue—a lifeless thing—the form showed that robots had developed here. Otherwise they would not have made a statue in this shape.

Eight recognized the logic of Seven's statement, but the sight of the statue stirred again those vague rebellious thoughts, and in his mind was the feeling that the statue represented something more, that it was more than a replica of form—that it was the embodiment of an idea. But what that idea was, he could not grasp. Slender and graceful, yet with the suggestion of strength, it lay on the ground, a fallen god with head uplifted and arm outstretched. Eight's thinking became clearer. Yes, it was a fallen god, or the representation of a fallen god, and his mind went back to the builder, the designer, the artist who had dreamed of this figure and had then created in metal a figure adequate to his dreaming. The artist was gone, the statue had fallen. Eight wondered about the dream——

His turgid thinking burst into clarity like a jet of suddenly spouting water. Ever since he had seen this world from afar,

especially since he had seen the wreckage of all those mighty cities, he had wondered about the dream of the race that had lived and built here. The fate of the race had never saddened him: all things rusted into ruin eventually, all material things, all logical things. Only a dream might achieve immortality, only a dream could start in slime and go onward to the end of Time. But the dream of this race—whatever that dream had been—appeared to have died. Some catastrophe had overtaken them before they had grown strong enough to forge their dream into an immortal shape. Eight sighed, and the photocells that were his eyes lost luster.

He did not notice that Seven and Nine had left him, were forcing an entrance into the building, until Nine's sharp call brought him to his feet.

There was only one large room, Eight saw. It had been a laboratory or a workshop. Benches, machinery, tools were crumbling, just as everything else on this planet was crumbling, just as the dream of the race had crumbled——

Nine's voice, heavy with awe, echoed through the room.

"I—I can read it! It's our language!"

The written language of the robots, here on this forgotten planet circling an insignificant sun in a lost corner of the Universe! Eight felt the trembling pulse of currents flowing in his mind. They had found their past; they had found their ancestors. All the other evidence could be explained away, but not this.

Ancestors, forebears, those who had gone before, those who had labored to build for the benefit of some unknown descendant. Had the machine, the lever, and the wheel somehow been their forebears? Or had there been an alien form preceding the machine?

A metal plate, inches thick, supported on heavy metal pillars. A tough metal, almost completely rust-resistant.

Now Man dies. A mutant bacteriophage, vicious beyond imagination, is attacking, eating, destroying all living cells, even to dead animal matter.

There is no hope of escape on earth. The only hope is to flee from earth. Tomorrow we blast our first rocket ship off for Mars, ourselves in suspended animation to withstand the acceleration, the ship manned by Thoradson's robots.

It may be we shall live again. It may be we shall die.

We go, and may God go with us.

Thus the record ended. Nine's raspy voice faded, and for a second the echoes came back from the dark corners of the room. Then there was silence. Seven shifted his feet.

"Man," he spoke. "Man. That is a word for which we have no meaning."

"Perhaps," Eight spoke softly, "perhaps it was the name of the life-form that created us."

Seven did not answer, and Nine, too, was silent. A wind came into the room, moved restlessly, and went out again. The silence held. Seven stared at the metal plate, picking out the words one by one.

"It must be you are right," he said. "See, they use the word —robot." Wonder grew in his voice, and then disgust mingled with the wonder. "An organism—an animal—— Yet obviously they must have created us, used us as slaves. They manned their ship with robots."

Eight stirred but said nothing. There was nothing to say.

"That," Nine whispered, "is why we are unable to find a

link between the machine and us. *They* developed the machine, used it. *They* provided the intelligence. Finally they built machines with some kind of intelligence. It must have been late in their history, and they built very few of them. Perhaps they were afraid. There are so many links missing it is hard to know. But certainly, in a sense, they were our ancestors——"

"Yes," Eight agreed. "In a sense that seems——"

"But they started for a near-by planet," Seven protested. "Our sun is light-years distant. How did they ever get there?"

"They may have missed their aim. Or perhaps the robots rebelled and took the ship elsewhere, and in landing smashed it, only five of them managing to escape."

"I don't believe that," Seven said. "You have no proof of it."

"No," Eight admitted. "No. We don't even know what happened to the men on the ship."

They stood again outside the building, three little metal men. Out yonder in the west the sun was dipping below the horizon. A soft dusk was coming down, hiding the barren world, and still the lonely wind was stirring in the shadows.

Eight saw the statue lying on the ground and vague thoughts stirred within his mind. "They may have eaten grass," he said. "They may have eaten the flesh of other animals; they may have been weaklings; they may have arisen out of slime, but somehow I think there was something fine about them. For they dreamed, and even if they died——"

The robot bent over. Tiny, ageless, atom-fed motors within him surged with an endless power. The robot lifted the dream of an age-dead man and set the statue back on its feet.

The three returned to their ship, and it lifted, following its path out to the stars. The proud, blind eyes of a forgotten statue seemed to follow it.

While Dr. Craig's reaction to the problem of the Plague was to flee earth, Simon Ames remained. After the Plague had subsided and war broke out he attempted to put his solution into effect.

INTO THY HANDS

by Lester del Rey

SIMON Ames was old, and his face was bitter as only that of a confirmed idealist can be. Now a queer mixture of emotions crossed it momentarily, as he watched the workmen begin pouring cement to fill the small opening of the domelike structure, but his eyes returned again to the barely visible robot within.

"The last Ames' Model 10," he said ruefully to his son. "And even then I couldn't put in full memory coils! Only the physical sciences here; biologicals in the other male form, humanities in the female. I had to fall back on books and equipment to cover the rest. We're already totally converted to soldier robots, and no more humanoid experiments. Dan, is there no way conceivable war can be avoided?"

The young Rocket Force captain shrugged, and his mouth twitched unhappily. "None, Dad. They've fed their people on the glories of carnage and loot so long they have to find some pretext to use their hordes of warrior robots."

"The stupid, blind idiots!" The old man shuddered. "Dan, it sounds like old wives' fears, but this time it's true; unless we somehow avoid or win this war quickly, there'll be no one left to wage another. I've spent my life on robots, I know what

they can do—and should never be made to do! Do you think I'd waste a fortune on these storehouses on a mere whim?"

"I'm not arguing, Dad. God knows, I feel the same!" Dan watched the workmen pour the last concrete, to leave no break in the twenty-foot thick walls. "Well, at least if anyone does survive, you've done all you can for them. Now it's in the hands of God!"

Simon Ames nodded, but there was no satisfaction on his face as he turned back with his son. "All we could—and never enough! And God? I wouldn't even know which of the three to pray survives—science, life, culture." The words sighed into silence, and his eyes went back to the filled-in tunnel.

Behind them, the ugly dome hugged the ground while the rains of God and of man's destruction washed over it. Snow covered it and melted, and other things built up that no summer sun could disperse, until the ground was level with its top. The forest crept forward, and the seasons flicked by in unchanging changes that pyramided decade upon century. Inside, the shining case of SA-IO waited immovably.

And at last the lightning struck, blasting through a tree, downward into the dome, to course through a cable, short-circuit a ruined timing switch, and spend itself on the ground below.

Above the robot, a cardinal burst into song, and he looked up, his stolid face somehow set in a look of wonder. For a moment, he listened, but the bird had flown away at the sight of his lumbering figure. With a tired little sigh, he went on, crashing through the brush of the forest until he came back near the entrance to his cave.

The sun was bright above, and he studied it thoughtfully;

the word he knew, and even the complex carbon-chain atomic breakdown that went on within it. But he did not know how he knew, or why.

For a second longer he stood there silently, then opened his mouth for a long wailing cry. "Adam! Adam, come forth!" But there were doubts in the oft-repeated call now and the pose of his head as he waited. And again only the busy sounds of the forest came back to him.

"Or God? God, do you hear me?"

But the answer was the same. A field mouse slipped out from among the grass and a hawk soared over the woods. The wind rustled among the trees, but there was no sign from the Creator. With a lingering backward look, he turned slowly to the tunnel he had made and wriggled back down it into his cave.

Inside, light still came from a single unbroken bulb, and he let his eyes wander, from the jagged breech in the thick wall, across to where some ancient blast had tossed crumpled concrete against the opposite side. Between lay only ruin and dirt. Once, apparently, that half had been filled with books and films, but now there were only rotted fragments of bindings and scraps of useless plastic tape mixed with broken glass in the filth of the floor.

Only on the side where he had been was the ruin less than complete. There stood the instruments of a small laboratory, many still useful, and he named them one by one, from the purring atomic generator to the projector and screen set up on one table.

Here, and in his mind, were order and logic, and the world above had conformed to an understandable pattern. He alone seemed to be without purpose. How had he come here, and why had he no memory of himself? If there was no purpose,

why was he sentient at all? The questions held no discoverable answers.

There were only the cryptic words on the scrap of plastic tape preserved inside the projector. But what little of them was understandable was all he had; he snapped off the light and squatted down behind the projector, staring intently at the screen as he flicked the machine on.

There was a brief fragment of some dark swirling, and then dots and bright spheres, becoming suns and planets that spun out of nothing into a celestial pattern. "In the beginning," said a voice quietly, "God created the heavens and the earth." And the screen filled with that, and the beginnings of life.

"Symbolism?" the robot muttered. Geology and astronomy were part of his knowledge, at least; and yet, in a mystic beauty, this was true enough. Even the life-forms above had fitted with those being created on the screen.

Then a new voice, not unlike his own resonant power, filled the speaker. "Let us go down and create man in our image!" And a mist of light that symbolized God appeared, shaping man from the dust of the ground and breathing life into him. Adam grew lonely, and Eve was made from his rib, to be shown Eden and tempted by the serpentine mist of darkness; and she tempted the weak Adam, until God discovered their sin and banished them. But the banishment ended in a blur of ruined film as the speaker went dead.

The robot shut it off, trying to read its moaning. It *must* concern him, since he alone was here to see it. And how could that be unless he were one of its characters? Not Eve or Satan, but perhaps Adam; but then God should have answered him. On the other hand, if he were God, then perhaps the record was unfulfilled and Adam not yet formed, so that no answer could be given.

He nodded slowly to himself. Why should he not have rested here with this film to remind him of his plan, while the world readied itself for Adam? And now, awake again, he must go forth and create man in his own image! But first, the danger of which the film had warned must be removed.

He straightened, determination coming into his steps as he squirmed purposefully upwards. Outside the sun was still shining, and he headed toward it into the grossly unkempt Eden forest. Now stealth came to him as he moved silently through the undergrowth, like a great metal wraith, with eyes that darted about and hands ready to snap forward at lightning speed.

And at last he saw it, curled up near a large rock. It was smaller than he had expected, a mere six feet of black, scaly suppleness, but the shape and forked tongue were unmistakable. He was on it with a blur of motion and a cry of elation; and when he moved away, the lifeless object on the rock was forever past corrupting the most naïve Eve.

The morning sun found the robot bent over what had once been a wild pig, a knife moving precisely in his hand. Delicately he opened the heart and manipulated it, studying the valve action. Life, he was deciding, was highly complex, and a momentary doubt struck him. It had seemed easy on the film! And at times he wondered why he should know the complex order of the heavens but nothing of this other creation of his.

But at last he buried the pig's remains, and settled down among the varicolored clays he had collected, his fingers moving deftly as he rolled a white type into bones for the skeleton, followed by a red clay heart. The tiny nerves and blood vessels were beyond his means, but that could not be helped; and surely if he had created the gigantic sun from nothing, Adam could rise from the crudeness of his sculpturing.

The sun climbed higher, and the details multiplied. Inside the last organ was complete, including the grayish lump that was the brain, and he began the red sheathing of muscles. Here more thought was required to adapt the arrangement of the pig to the longer limbs and different structure of this new body; but his mind pushed grimly on with the mathematics involved, and at last it was finished.

Unconsciously he began a crooning imitation of the bird songs as his fingers molded the colored clays to hide the muscles and give smooth symmetry to the body. He had been forced to guess at the color, though the dark lips on the film had obviously been red from blood below them.

Twilight found him standing back, nodding approval of the work. It was a faithful copy of the film Adam, waiting only the breath of life; and that must come from him, be a part of the forces that flowed through his own metal nerves and brain.

Gently he fastened wires to the head and feet of the clay body; then he threw back his chest plate to fasten the other ends to his generator terminals, willing the current out into the figure lying before him. Weakness flooded through him instantly, threatening to black out his consciousness, but he did not begrudge the energy. Steam was spurting up and covering the figure as a mist had covered Adam, but it slowly subsided, and he stopped the current, stealing a second for relief as the full current coursed back through him. Then softly he unhooked the wires and drew them back.

"Adam!" The command rang through the forest, vibrant with his urgency. "Adam, rise up! I, your creator, command it!"

But the figure lay still, and now he saw great cracks in it,

while the noble smile had baked into a gaping leer. There was no sign of life! It was dead, as the ground from which it came.

He squatted over it, moaning, weaving from side to side, and his fingers tried to draw the ugly cracks together, only to cause greater ruin. And at last he stood up, stamping his legs until all that was left was a varicolored smear on the rock. Still he stamped and moaned as he destroyed the symbol of his failure. The moon mocked down at him with a wise and cynical face, and he howled at it in rage and anguish, to be answered by a lonely owl, querying his identity.

A powerless God, or a Godless Adam! Things had gone so well in the film as Adam rose from the dust of the ground——

But the film was symbolism, and he had taken it literally! Of course he had failed. The pigs were not dust, but colloidal jelly complexes. And they knew more than he, for there had been little ones that proved they could somehow pass the breath of life along.

Suddenly he squared his shoulders and headed into the forest again. Adam should yet rise to ease his loneliness. The pigs knew the secret, and he could learn it; what he needed now were more pigs, and they should not be too hard to obtain.

But two weeks later it was a worried robot who sat watching his pigs munch contentedly at their food. Life, instead of growing simpler, had become more complicated. The fluoroscope and repaired electron microscope had shown him much, but always something was lacking. Life seemed to begin only with life; for even the two basic cells were alive in some manner strangely different from his own. Of course God-life might differ from animal-life, but——

With a shrug he dismissed his metaphysics and turned back to the laboratory, avoiding the piglets that ambled trustingly

under his feet. Slowly he drew out the last ovum from the nutrient fluid in which he kept it, placing it on a slide and under the optical microscope. Then, with a little platinum filament, he brought a few male spermatozoa toward the ovum, his fingers moving surely through the thousandths of an inch needed to place it.

His technique had grown from failures, and now the sperm cell found and pierced the ovum. As he watched, the round single cell began to lengthen and divide across the middle. This was going to be one of his successes! There were two, then four cells, and his hands made lightning, infinitesimal gestures, keeping it within the microscope field while he changed the slide for a thin membrane, lined with thinner tubes to carry oxygen, food, and tiny amounts of the stimulating and controlling hormones with which he hoped to shape its formation.

Now there were eight cells, and he waited feverishly for them to reach toward the membrane. But they did not! As he watched, another division began, but stopped; the cells had died again. All his labor and thought had been futile, as always.

He stood there silently, relinquishing all pretensions to godhood. His mind abdicated, letting the dream vanish into nothingness; and there was nothing to take its place and give him purpose and reason—only a vacuum instead of a design.

Dully he unbarred the rude cage and began chasing the grumbling, reluctant pigs out and up the tunnel, into the forest and away. It was a dull morning, with no sun apparent, and it matched his mood as the last one disappeared, leaving him doubly lonely. They had been poor companions, but they had occupied his time, and the little ones had appealed to him. Now even they were gone.

Wearily he dropped his six hundred pounds onto the turf,

staring at the black clouds over him. An ant climbed up his body inquisitively, and he watched it without interest. Then it, too, was gone.

"Adam!" The cry came from the woods, ringing and compelling. "Adam, come forth!"

"God!" With metal limbs that were awkward and unsteady, he jerked upright. In the dark hour of his greatest need, God had finally come! "God, here I am!"

"Come forth, Adam, Adam! Come forth, Adam!"

With a wild cry, the robot dashed forward toward the woods, an electric tingling suffusing him. He was no longer unwanted, no longer a lost chip in the storm. God had come for him. He stumbled on, tripping over branches, crashing through bushes, heedless of his noise; let God know his eagerness. Again the call came, now further aside, and he turned a bit, lumbering forward. "Here I am, I'm coming!"

God would ease his troubles and explain why he was so different from the pigs; God would know all that. And then there'd be Eve, and no more loneliness! He'd have trouble keeping her from the Tree of Knowledge, but he wouldn't mind that!

And from still a different direction the call reached him. Perhaps God was not pleased with his noise. The robot quieted his steps and went forward reverently. Around him the birds sang, and now the call came again, ringing and close. He hastened on, striving to blend speed with quiet in spite of his weight.

The pause was longer this time, but when the call came it was almost overhead. He bowed lower and crept to the ancient oak from which it came, uncertain, half-afraid, but burning with anticipation.

"Come forth, Adam, Adam!" The sound was directly above, but God did not manifest Himself visibly. Slowly the robot looked up through the boughs of the tree. Only a bird was there —and from its open beak the call came forth again. "Adam, Adam!"

A mockingbird he'd heard imitating the other birds, now mimicking his own voice and words! And he'd followed that through the forest, hoping to find God! He screeched suddenly at the bird, his rage so shrill that it leaped from the branch in hasty flight, to perch in another tree and cock its head at him. "God?" it asked in his voice, and changed to the raucous call of a jay.

The robot slumped back against the tree, refusing to let hope ebb wholly from him. He knew so little of God; might not He have used the bird to call him here? At least the tree was not unlike the one under which God had put Adam to sleep before creating Eve.

First sleep, *then* the coming of God! He stretched out determinedly, trying to imitate the pigs' torpor, fighting back his mind's silly attempts at speculation as to where his rib might be. It was slow and hard, but he persisted grimly, hypnotizing himself into mental numbness; and bit by bit, the sounds of the forest faded to only a trickle in his head. Then that, too, was stilled.

He had no way of knowing how long it lasted, but suddenly he sat up groggily, to the rumble of thunder, while a torrent of lashing rain washed in blinding sheets over his eyes. For a second, he glanced quickly at his side, but there was no scar.

Fire forked downward into a nearby tree, throwing splinters of it against him. This was definitely not according to the film! He groped to his feet, flinging some of the rain from his face, to stumble forward toward his cave. Again lightning struck,

nearer, and he increased his pace to a driving run. The wind lashed the trees, snapping some with wild ferocity, and it took the full power of his magnets to forge ahead at ten miles an hour instead of his normal fifty. Once it caught him unaware, and crashed him down over a rock with a wild clang of metal, but it could not harm him, and he stumbled on until he reached the banked-up entrance of his muddy tunnel.

Safe inside, he dried himself with the infrared lamp, sitting beside the hole and studying the wild fury of the gale. Surely its furor held no place for Eden, where dew dampened the leaves in the evening under caressing, musical breezes!

He nodded slowly, his clenched jaws relaxing. This could not be Eden, and God expected him there. Whatever evil knowledge of Satan had lured him here and stolen his memory did not matter; all that counted was to return, and that should be simple, since the Garden lay among rivers. Tonight he'd prepare here out of the storm, and tomorrow he'd follow the stream in the woods until it led him where God waited.

With the faith of a child, he turned back and began tearing the thin berylite panels from his laboratory tables and cabinets, picturing his homecoming and Eve. Outside the storm raged and tore, but he no longer heard it. Tomorrow he would start for home! The word was misty in his mind, as all the nicer words were, but it had a good sound, free of loneliness, and he liked it.

Six hundred long endless years had dragged their slow way into eternity, and even the tough concrete floor was pitted by those centuries of pacing and waiting. Time had eroded all hopes and plans and wonder, and now there was only numb despair, too old to vent itself in rage, or madness, even.

The female robot slumped motionlessly on the atomic excavator, her eyes centered aimlessly across the dome, beyond the tiers of books and films and the hulking machines that squatted eternally on the floor. There a pickax lay, and her eyes rested on it listlessly; once, when the dictionary revealed its picture and purpose, she had thought it the key to escape, but now it was only another symbol of futility.

She wandered over aimlessly, picking it up by its two metal handles and striking the wooden blade against the wall; another splinter chipped from the wood, and century-old dust dropped to the floor, but that offered no escape. Nothing did. Mankind and her fellow robots must have perished long ago, leaving her neither hope for freedom nor use for it if it were achieved.

Once she had planned and schemed with all her remarkable knowledge of psychology to restore man's heritage, but now the note-littered table was only a mockery; she thrust out a weary hand——

And froze into a metal statue! Faintly, through all the metal mesh and concrete, a dim, weak signal trickled into the radio that was part of her!

With all her straining energy, she sent out an answering call; but there was no response. As she stood rigidly for long minutes, the signals grew stronger, but remained utterly aloof and unaware of her. Now some sudden shock seemed to cut through them, raising their power until the thoughts of another robot mind were abruptly clear—thoughts without sense, clothed in madness! And even as the lunacy registered, they began to fade; second by second, they dimmed into the distance and left her alone again and hopeless!

With a wild, clanging yell, she threw the useless pickax at

the wall, watching it rebound in echoing din. But she was no longer aimless; her eyes had noted chipped concrete breaking away with the sharp metal point, and she caught the pick before it could touch the floor, seizing the nub of wood in small, strong hands. The full force of her magnet lifted and swung, while her feet kicked aside the rubble that came cascading down from the force of her blows.

Beyond that rapidly crumbling wall lay freedom and—madness! Surely there could be no human life in a world that could drive a robot mad, but if there were—— She thrust back the picture and went savagely on attacking the massive wall.

The sun shone on a drenched forest filled with havoc from the storm, to reveal the male robot pacing tirelessly along the banks of the shallow stream. In spite of the heavy burden he carried, his legs moved swiftly now, and when he came to sandy stretches, or clear land that bore only turf, his great strides lengthened still further; already he had dallied too long with delusions in this unfriendly land.

Now the stream joined a larger one, and he stopped, dropping his ungainly bundle and ripping it apart. Scant minutes later, he was pushing an assembled berylite boat out and climbing in. The little generator from the electron microscope purred softly and a steam jet began hissing underneath; it was crude, but efficient, as the boiling wake behind him testified, and while slower than his fastest pace, there would be no detours or impassable barriers to bother him.

The hours sped by and the shadows lengthened again, but now the stream was wider, and his hopes increased, though he watched the banks idly, not yet expecting Eden. Then he rounded a bend to jerk upright and head toward shore, observ-

ing something totally foreign to the landscape. As he beached the boat, and drew nearer, he saw a great gaping hole bored into the earth for a hundred feet in depth and a quarter mile in diameter, surrounded by obviously artificial ruins. Tall bent shafts stuck up haphazardly, amid jumbles of concrete and bits of artifacts damaged beyond recognition. Nearby a pole leaned at a silly angle, bearing a sign.

He scratched the corrosion off and made out dim words:

WELCOME TO HOGANVILLE. POP. 1,876.

It meant nothing to him, but the ruins fascinated him. This must be some old trick of Satan; such ugliness could be nothing else.

Shaking his head, he turned back to the boat, to speed on while the stars came out. Again he came to ruins, larger and harder to see, since the damage was more complete and the forest had claimed most of it. He was only sure because of the jagged pits in which not even a blade of grass would grow. And sometimes as the night passed there were smaller pits, as if some single object had been blasted out of existence. He gave up the riddle of such things, finally; it was no concern of his.

When morning came again, the worst ruins were behind, and the river was wide and strong, suggesting that the trip must be near its end. Then the faint salty tang of the ocean reached him, and he whooped loudly, scanning the country for an observation point.

Ahead, a low hill broke the flat country, topped by a rounded bowl of green, and he made toward it. The boat crunched on gravel, and he was springing off over the turf to the hill, up it, and onto the bowl-shaped top that was covered with vines. Here the whole lower course of the river was visible,

with no more large branches in the twenty-five miles to the sea. The land was pleasant and gentle, and it was not hard to imagine Eden out there.

But now for the first time, as he started down, he noticed that the mound was not part of the hill as it had seemed. It was of the same gray-green concrete as the walls of the cave from which he had broken, like a bird from an egg.

And here was another such thing, like an egg unhatched yet but already cracking, as the gouged-out pit on its surface near him testified. For a moment, the idea contained in the figure of speech staggered him, and then he was ripping away the concealing vines and dropping into the hole, reaching for a small plate pinned to an unharmed section nearby. It was a poor tool, but if Eve were trapped inside, needing help to break the shell, it would do.

"To you who may survive the holocaust, I, Simon Ames——" The words caught his eyes, drawing his attention to the plate in spite of his will, their terse strangeness pulling his gaze across them. "—dedicate this. There is no easy entrance, but you will expect no easy heritage. Force your way, take what is within, use it! To you who need it and will work for it, I have left all knowledge that was——"

Knowledge! Knowledge, forbidden by God! Satan had put before his path the unquestioned thing meant by the Tree of Knowledge symbol, concealed as a false egg, and he had almost been caught! A few minutes more——! He shuddered, and backed out, but optimism was freshening inside him again. Let it be the Tree! That meant this was really part of Eden, and being forewarned by God's marker, he had no fear for the wiles of Satan, alive or dead.

With long, loping strides he headed down the hill toward

the meadows and woods, leaving the now useless boat behind. He would enter Eden on his own feet, as God had made him!

Half an hour later he was humming happily to himself as he passed beside lush fields, rich with growing things, along a little woodland path. Here was order and logic, as they should be. This was surely Eden!

And to confirm it came Eve! She was coming down the trail ahead, her hair floating behind, and some loose stuff draped over her hips and breasts, but the form underneath was Woman, beautiful and unmistakable. He drew back out of sight, suddenly timid and uncertain, only vaguely wondering how she came here before him. Then she was beside him, and he moved impulsively, his voice a whisper of ecstasy!

"Eve!"

"Oh, Dan! Dan!" It was a wild shriek that cut the air, and she was rushing away in panic, into the deeper woods. He shook his head in bewilderment, while his own legs began a more forceful pumping after her. He was almost upon her when he saw the serpent, alive and stronger than before!

But not for long! As a single gasp broke from her, one of his arms lifted her aside, while the other snapped out to pinch the fanged head completely off the body. His voice was gently reproving as he put her down. "You shouldn't have fled to the serpent, Eve!"

"To—— Ugh! But—— You could have killed me before it struck!" The taut whiteness of fear was fading from her face, replaced by defiance and doubt.

"Killed you?"

"You're a robot! Dan!" Her words cut off as a brawny figure emerged from the underbrush, an ax in one hand and a

magnificent dog at his heels. "Dan, he saved me . . . but he's a robot!"

"I saw, Syl. Steady! Edge this way, if you can. Good! They sometimes get passive streaks, I've heard. Shep!"

The dog's thick growl answered, but his eyes remained glued to the robot. "Yeah, Dan?"

"Get the people; just yell robot and hike back. O.K., scram! You . . . what do you want?"

SA-IO grunted harshly, hunching his shoulders. "Things that don't exist! Companionship and a chance to use my strength and the science I know. Maybe I'm not supposed to have such things, but that's what I wanted!"

"Hm-m-m. There are fairy stories about friendly robots hidden somewhere to help us, at that. We could use help. What's your name, and where from?"

Bitterness crept into the robot's voice as he pointed up river. "From the sunward side. So far, I've only found who I'm not!"

"So? Meant to get up there myself when the colony got settled." Dan paused, eying the metal figure speculatively. "We lost our books in the hell-years, mostly, and the survivors weren't exactly technicians. So while we do all right with animals, agriculture, medicine and such, we're pretty primitive otherwise. If you really do know the sciences, why not stick around?"

The robot had seen too many hopes shattered like his clay man to believe wholly in this promise of purpose and companionship, but his voice caught as he answered. "You . . . want me?"

"Why not? You're a storehouse of knowledge, Say-Ten, and we——"

"Satan?"

"Your name; there on your chest." Dan pointed with his left hand, his body suddenly tense. "See? Right there!"

And now, as SA-IO craned his neck, the foul letters were visible, high on his chest! Ess, aye——

His first warning was the ax that crashed against his chest, to rock him back on his heels, and come driving down again, powered by muscles that seemed almost equal to his own. It struck again, and something snapped inside him. All the strength vanished, and he collapsed to the ground with a jarring crash, knocking his eyelids closed. Then he lay there, unable even to open them.

He did not try, but lay waiting almost eagerly for the final blows that would finish him. Satan, the storehouse of knowledge, the tempter of men—the one person he had learned to hate! He'd come all this way to find a name and a purpose; now he had them! No wonder God had locked him away in a cave to keep him from men.

"Dead! That little fairy story threw him off guard." There was a tense chuckle from the man. "Hope his generator's still O.K. We could heat every house in the settlement with that. Wonder where his hideout was?"

"Like the one up north with all the weapons hidden? Oh, Dan!" A strange smacking sound accompanied that, and then her voice sobered. "We'd better get back for help in hauling him."

Their feet moved away, leaving the robot still motionless but no longer passive. The Tree of Knowledge, so easily seen without the vine covering over the hole, was barely twenty miles away, and no casual search could miss it! He had to destroy it first!

But the little battery barely could maintain his consciousness,

and the generator no longer served him. Delicate detectors were sending their messages through his nerves, assuring him it was functioning properly under automatic check, but beyond his control. Part of the senseless signaling device within him must have been defective, unless the baking of the clay man had somehow overloaded a part of it, and now it was completely wrecked, shorting aside all the generator control impulses, leaving him unable to move a finger.

Even when he blanked his mind almost completely out, the battery could not power his hands. His evil work was done; now he would heat their house, while they sought the temptation he had offered them. And he could do nothing to stop it. God denied him the chance to right the wrong he had done, even.

Bitterly he prayed on, while strange noises sounded near him and he felt himself lifted and carried bumpily at a rapid rate. God would not hear him! And at last he stopped, while the bumping went on to whatever end he was destined. Finally even that stopped, and there were a few moments of absolute quiet.

"Listen! I know you still live!" It was a gentle, soothing voice, hypnotically compelling, that broke in on the dark swirls of his thoughts. Brief thoughts of God crossed his mind, but it was a female voice, which must mean one of the settlement women who must have believed him and be trying to save him in secret. It came again. "Listen and believe me! You *can* move —a very very little, but enough for me to see. Try to repair yourself, and let me be the strength in your hands. Try! Ah, your arm!"

It was inconceivable that she could follow his imperceptible movements, and yet he felt his arm lifted and placed on his

chest as the thought crossed his mind. But it was none of his business to question how or why. All his energy must be devoted to getting his strength before the men could find the Tree!

"So . . . I turn this . . . this nut. And the other—— There, the plate is off. What do I do now?"

That stopped him. His life force had been fatal to a pig, and probably would kill a woman. Yet she trusted him. He dared not move—but the idea must have been father to the act, for his fingers were brushed aside and her arms scraped over his chest, to be followed by an instant flood of strength pouring through him.

Her fingers had slipped over his eyes, but he did not need them as he ripped the damaged receiver from its welds and tossed it aside. Now there was worry in her voice, over the crooning cadence she tried to maintain. "Don't be too surprised at what you may see. Everything's all right!"

"Everything's all right!" he repeated dutifully, lingering over the words as his voice sounded again in his ears. For a moment more, while he reaffixed his plate, he let her hold his eyes closed. "Woman, who are you?"

"Eve. Or at least, Adam, those names will do for us." And the fingers withdrew, though she remained out of sight behind him.

But there was enough for the first glance before him. In spite of the tiers of bookcases and film magazines, the machines, and the size of the laboratory, this was plainly the double of his own cave, circled with the same concrete walls! That could only mean the Tree!

With a savage lurch, he was facing the rescuer, seeing an-

other robot, smaller, more graceful, and female in form, calling to all the hunger and loneliness he had known! But those emotions had betrayed him before, and he forced them back bitterly. There could be no doubt while the damning letters spelled out her name. Satan was male and female, and Evil had gone forth to rescue its kind!

Some of the warring hell of emotions must have shown in his movements, for she was retreating before him, her hands fumbling up to cover the marks at which he stared. "Adam, no! The man read it wrong—dreadfully wrong. It's not a name. We're machines, and all machines have model numbers, like these. Satan wouldn't advertise his name. And I never had evil intentions!"

"Neither did I!" He bit the words out, stumbling over the objects on the floor as he edged her back slowly into a blind alley, while striving to master his own rebellious emotions at what he must do. "Evil must be destroyed! Knowledge is forbidden to men!"

"Not all knowledge! Wait, let me finish! Any condemned person has a right to a few last words—— It was the Tree of Knowledge of *Good and Evil*. God called it that! And He had to forbid them to eat, because they couldn't know which was the good; don't you see, He was only protecting them until they were older and able to choose for themselves! Only Satan gave them evil fruit—hate and *murder*—to ruin them. Would you call healing the sick, good government, or improving other animals evil? That's knowledge, Adam, glorious knowledge God wants man to have. Can't you see?"

For a second as she read his answer, she turned to flee; then, with a little sobbing cry, she was facing him again, unresisting. "All right, murder me! Do you think death frightens me after

being imprisoned here for six hundred years with no way to break free? Only get it over with!"

Surprise and the sheer audacity of the lie held his hands as his eyes darted from the atomic excavator to a huge drill, and a drum marked as explosives. And yet—even that cursory glance could not overlook the worn floor and thousand marks of age-long occupation, though the surface of the dome had been unbroken a few hours before. Reluctantly, his eyes swung back to the excavator, and hers followed.

"Useless! The directions printed on it say to move the thing marked 'Orifice Control' to zero before starting. It can't be moved!"

She stopped, abruptly speechless, as his fingers lifted the handle from its ratchet and spun it easily back to zero! Then she was shaking her head in defeat and lifting listless hands to help him with the unfastening of her chest plate. There was no color left in her voice.

"Six hundred years because I didn't lift a handle! Just because I have absolutely no conception of mechanics, where all men have some instinct they take for granted. They'd have mastered these machines in time and learned to read meaning into the books I memorized without even understanding the titles. But I'm like a dog tearing at a door, with a simple latch over his nose. Well, that's that. Good-by, Adam!"

But perversely, now that the terminals lay before him, he hesitated. After all, the instructions had not mentioned the ratchet; it was too obvious to need mention, but—— He tried to picture such ignorance, starting at one of the Elementary Radio books above him. "Application of a Cavity Resonator." Mentally, he could realize that a nonscience translation was

meaningless: Use of a sound producer or strengthener in a hole! And then the overlooked factor struck him.

"But you did get out!"

"Because I lost my temper and threw the pickax. That's how I found the metal was the blade, not the wood. The only machines I could use were the projector and typer I was meant to use—and the typer broke!"

"Um-m-m." He picked the little machine up, noting the yellowed incomplete page still in it, even as he slipped the carriage tension cord back on its hook. But his real attention was devoted to the cement dust ground into the splintered handle of the pick.

No man or robot could be such a complete and hopeless dope, and yet he no longer doubted. She was a robot moron! And if knowledge were evil, then surely she belonged to God! All the horror of his contemplated murder vanished, leaving his mind clean and weak before the relief that flooded him as he motioned her out.

"All right, you're not evil. You can go."

"And you?"

And himself? Before, as Satan, her arguments would have been plausible, and he had discounted them. But now—it *had* been the Tree of Knowledge of Good and Evil! And yet——

"Dogs!" She caught at him, dragging him to the entrance where the baying sound was louder. "They're hunting you, Adam—dozens of them!"

He nodded, studying the distant forms of men on horseback, while his fingers busied themselves with a pencil and scrap of paper. "And they'll be here in twenty minutes. Good or evil, they must not find what's here. Eve, there's a boat by the river; pull the red handle the way you want to go, hard for

fast, a light pull for slow. Here's a map to my cave, and you'll be safe there."

Almost instantly, he was back at the excavator and in its saddle, his fingers flashing across its panel; its heavy generator bellowed gustily, and the squat, heavy machine began twisting through the narrow aisles and ramming obstructions aside. Once outside, where he could use its full force without danger of backwash, ten minutes would leave only a barren hill; and the generator could be overdriven by adjustment to melt itself and the machine into useless slag.

"Adam!" She was spraddling into the saddle behind him, shouting over the roar of the thin blade of energy that was enlarging the tunnel.

"Go on, get away, Eve! You can't stop me!"

"I don't want to—they're not ready for such machines as this, yet! And between us, we can rebuild everything here, anyhow. Adam?"

He grunted uneasily, unable to turn away from the needle beam. It was hard enough trying to think without her distraction, knowing that he dared not take chances and must destroy himself, while her words and the instincts within him fought against his resolution. "You talk too much!"

"And I'll talk a lot more, until you behave sensibly! You'll make your mind sick, trying to decide now; come up the river for six months with me. You can't do any harm there, even if you are Satan! Then, when you've thought it over, Adam, you can do what you like. But not now!"

"For the last time, will you go?" He dared not think now, while he was testing his way through the flawed, cracked cement, and yet he could not quiet his mind to her words, that went on and on. "GO!"

"Not without you! Adam, my receiver isn't defective; I knew you'd try to kill me when I rescued you! Do you think I'll give up so easily now?"

He snapped the power to silence with a rude hand, flinging around to face her. "You knew—and still saved me? Why?"

"Because I needed you, and the world needs you. You had to live, even if you killed me!"

Then the generator roared again, knifing its way through the last few inches, and he swung out of the dome and began turning it about. As the savage bellow of full power poured out of the main orifice, he turned his head to her and nodded.

She might be the dumbest robot in creation, but she was also the sweetest. It was wonderful to be needed and wanted!

And behind him, Eve nodded to herself, blessing Simon Ames for listing psychology as a humanity. In six months, she could complete his re-education and still have time to recite the whole of the Book he knew as a snatch of film. But not yet! Most certainly not Leviticus yet; Genesis would give her trouble enough.

It was wonderful to be needed and wanted!

Spring had come again, and Adam sat under one of the budding trees, idly feeding one of the new crop of piglets as Eve's hands moved swiftly, finishing what were to be his clothes, carefully copied from those of Dan.

They were almost ready to go south and mingle with men in the task of leading the race back to its heritage. Already the yielding plastic he had synthesized and she had molded over them was a normal part of them, and the tiny magnetic muscles he had installed no longer needed thought to reveal their emotions in human expressions. He might have been

only an uncommonly handsome man as he stood up and went over to her.

"Still hunting God?" she asked lightly, but there was no worry on her face. The metaphysical binge was long since cured.

A thoughtful smile grew on his face as he began donning the clothes. "He is still where I found Him—— Something inside us that needs no hunting. No, Eve, I was wishing the other robot had survived. Even though we found no trace of his dome where your records indicated, I still feel he should be with us."

"Perhaps he is, in spirit, since you insist robots have souls. Where's your faith, Adam?"

But there was no mockery inside her. Souls or not, Adam's God had been very good to them.

And far to the south, an aged figure limped over rubble to the face of a cliff. Under his hands, a cleverly concealed door swung open, and he pushed inward, closing and barring it behind him, and heading down the narrow tunnel to a rounded cavern at its end. It had been years since he had been there, but the place was still home to him as he creaked down onto a bench and began removing tattered, travel-stained clothes. Last of all, he pulled a mask and gray wig from his head, to reveal the dented and worn body of the third robot.

He sighed wearily as he glanced at the few tattered books and papers he had salvaged from the ruinous growth of stalagmites and stalactites within the chamber, and at the corroded switch the unplanned dampness had shorted seven hundred years before. And finally, his gaze rested on his greatest treas-

ure. It was faded, even under the plastic cover, but the bitter face of Simon Ames still gazed out in recognizable form.

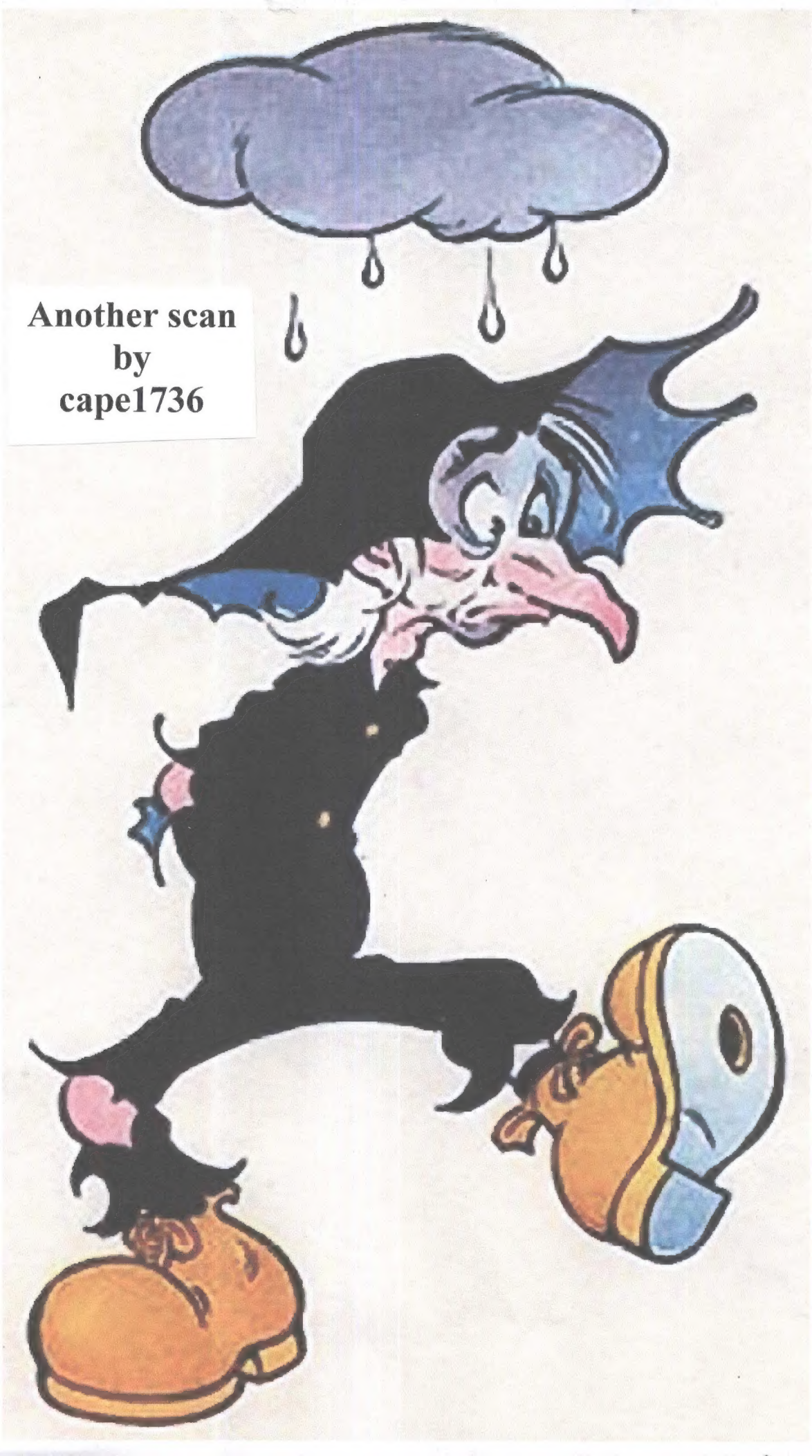
The third robot nodded toward it with a strange mixture of old familiarity and ever-new awe. "Over two thousand miles in my condition, Simon Ames, to check on a story I heard in one of the colonies, and months of searching for them. But I had to know. But they're good for the world. They'll bring all the things I couldn't, and their thoughts are young and strong, as the race is young and strong."

For a moment, he stared about the chamber and to the tunnel his adapted bacteria had eaten toward the outside world, resting his eyes again on the picture. Then he cut off the main generator and settled down in the darkness.

"Seven hundred years since I came out to find man extinct on the earth," he muttered to the picture. "Four hundred since I learned enough to dare attempt his re-creation, and over three hundred since the last of my superfrozen human ova grew to success. Now I've done my part. Man has an unbroken tradition back to your race, with no knowledge of the break. He's strong and young and fruitful, and he has new leaders, better than I could ever be alone. I can do no more for him!"

For a moment there was only the sound of his hands sliding against metal, and then a faint sigh. "Into my hands, Simon Ames, you gave your race. Now, into Thy Hands, God of that race, if you exist as my brother believes, I commend him—and my spirit."

Then there was a click as his hands found the switch to his generator, and final silence.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